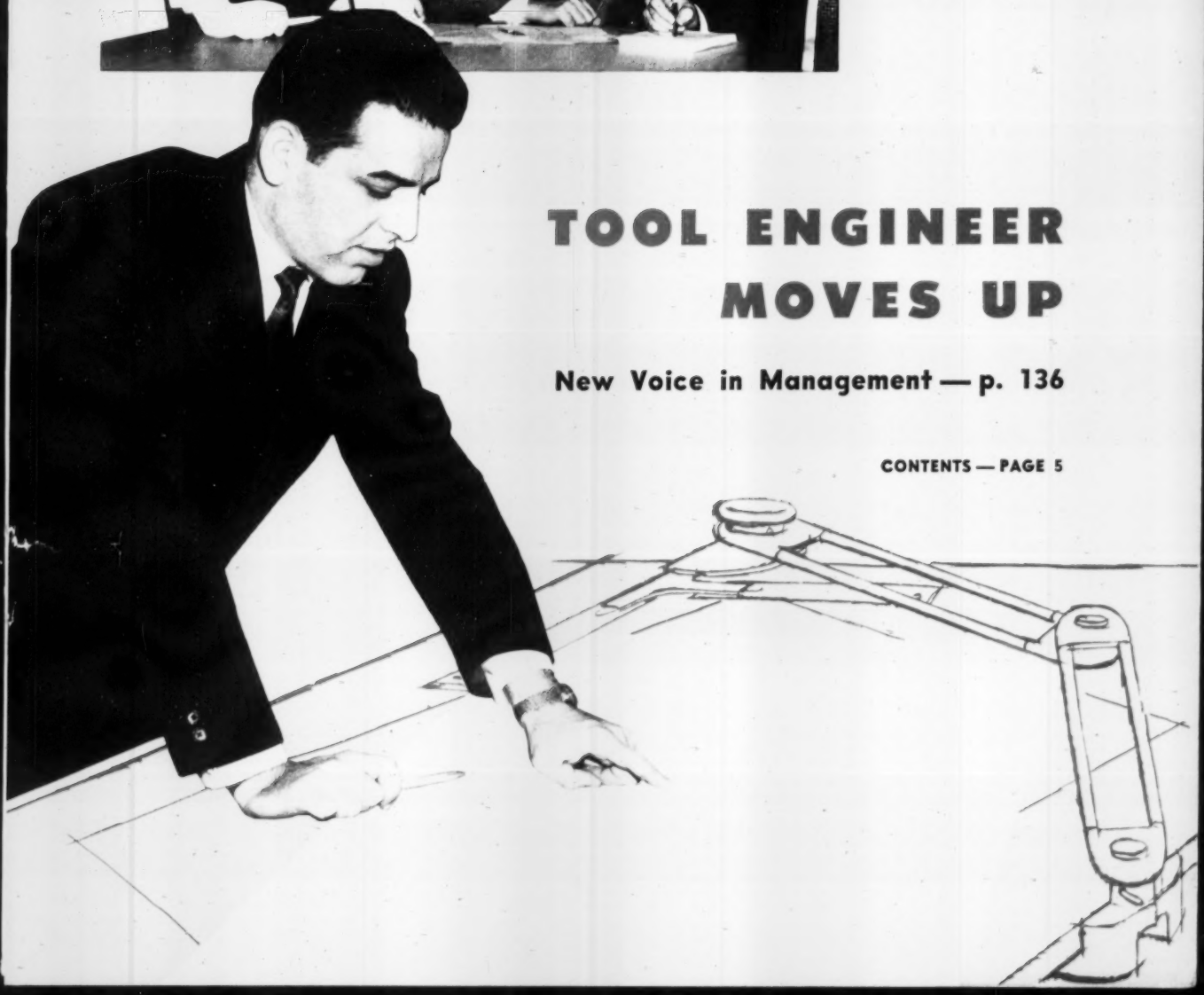
APRIL 19, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING



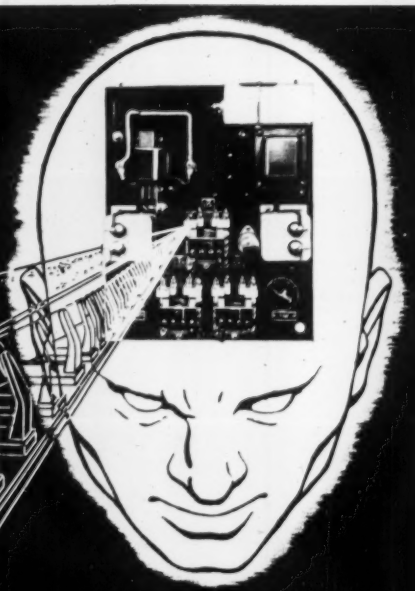
TOOL ENGINEER MOVES UP

New Voice in Management — p. 136

CONTENTS — PAGE 5

Electronic Brain

CONTROLS WORLD'S LONGEST SINGLE-FLIGHT CONVEYOR BELT!*



*11,000-foot rubber belt in mile-long conveyor handles coke between coking plant and blast furnaces at large eastern steel mill.

In this installation, the NEO-TIME-CURRENT ELECTRONIC ACCELERATOR (in white circle) is shown on an EC&M 150 h. p. 440-volt starter.

EC&M AUTOMATIC ACCELERATOR MODIFIES TIME BY MOTOR CURRENT TO COMPENSATE FOR LOAD AND WEATHER CONDITIONS

THE EC&M NEO-TIME-CURRENT METHOD OF ACCELERATION is not just time limit or current limit . . . it actually combines the advantages of both to give positive acceleration modified by load conditions. As its name implies, it is inherently self-adjusting and automatically provides for (1) fast acceleration of an empty belt on a hot day and (2) slow acceleration of a loaded belt under icy conditions.

NEO-TIME-CURRENT STARTER FEATURES:

1. It permits use of single motor-drive on long conveyors.
2. Belt stretching is controlled within safe limits during acceleration.
3. Convenient adjusting dials can be set for slow start during break-in period and then gradually changed to give most efficient acceleration for best operation.
4. After tune-up, further manual adjustment is eliminated by automatic self-adjusting characteristic of the Neo-Time-Current.

For Details and Specifications, Write Today for Booklet 1041.

E C & M

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

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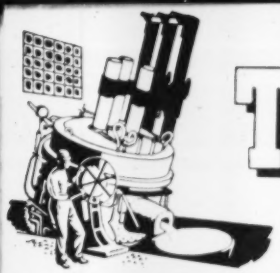


Tool Steel Topics

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM TOOL STEEL ENGINEER SAYS:

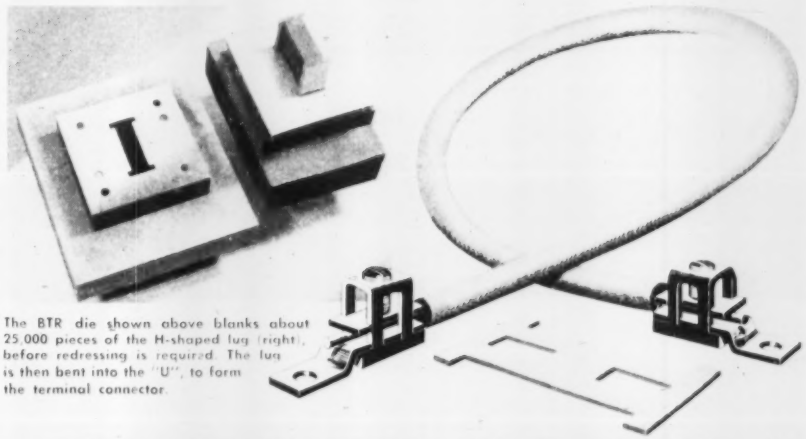
Be Sure to Heat Tools Uniformly

It has always been widely recommended that tools be heated uniformly to the hardening temperature. Unfortunately, this practice is seldom followed.

Absolute uniformity is impossible, as the outer surfaces of a tool must be heated before the interior. The uniformity of heating which results when a tool of constant cross-section is heated, by first preheating and then transferring to a furnace operating at the hardening temperature, is generally satisfactory.

However, when a tool of varying section is encountered (for example 1 in. at one end, and 3 in. at the other end), uniformity of heating cannot be attained by heating in open furnaces. What's the answer? Simply pack the tool in cast iron chips in a container. Heating through the chips occurs so slowly that the tool can be heated uniformly regardless of section variations.

This procedure can be followed with most types of tool steels — with one exception. With high-speed steels, cast-iron chips cannot be used because the cast iron melts at the temperatures used in heat-treating high-speed steels.



The BTR die shown above blanks about 25,000 pieces of the H-shaped lug (right), before redressing is required. The lug is then bent into the "U", to form the terminal connector.

BTR DIE BLANKS 25,000 LUGS FROM STRIP STEEL BETWEEN GRINDS

One of the parts produced by Pelham Electric Manufacturing Corp., Erie, Pa., is a solderless U-shaped lug, for use on panelboards and switchboards. The lug is blanked from hot-rolled strip steel, $\frac{1}{8}$ in. thick. Engineers at the Pelham plant selected BTR for the die, and they've had every reason to be pleased with its performance.

The die, operating in a 25-ton press, has a Rockwell C hardness of 60-62. It's economical, because it produces 25,000 pieces between grinds, with only .008 in. to .010 in. removed in redressing. And it is standing up well on both counts — good wear-resistance and good shock-resistance.

BTR is our general-purpose oil-hardening tool steel of the manganese-chromium-tungsten-vanadium type. In addition to being resistant to wear and shock, BTR has a good reputation for low distortion, and for ease of machining and heat treatment.

BTR TYPICAL ANALYSIS

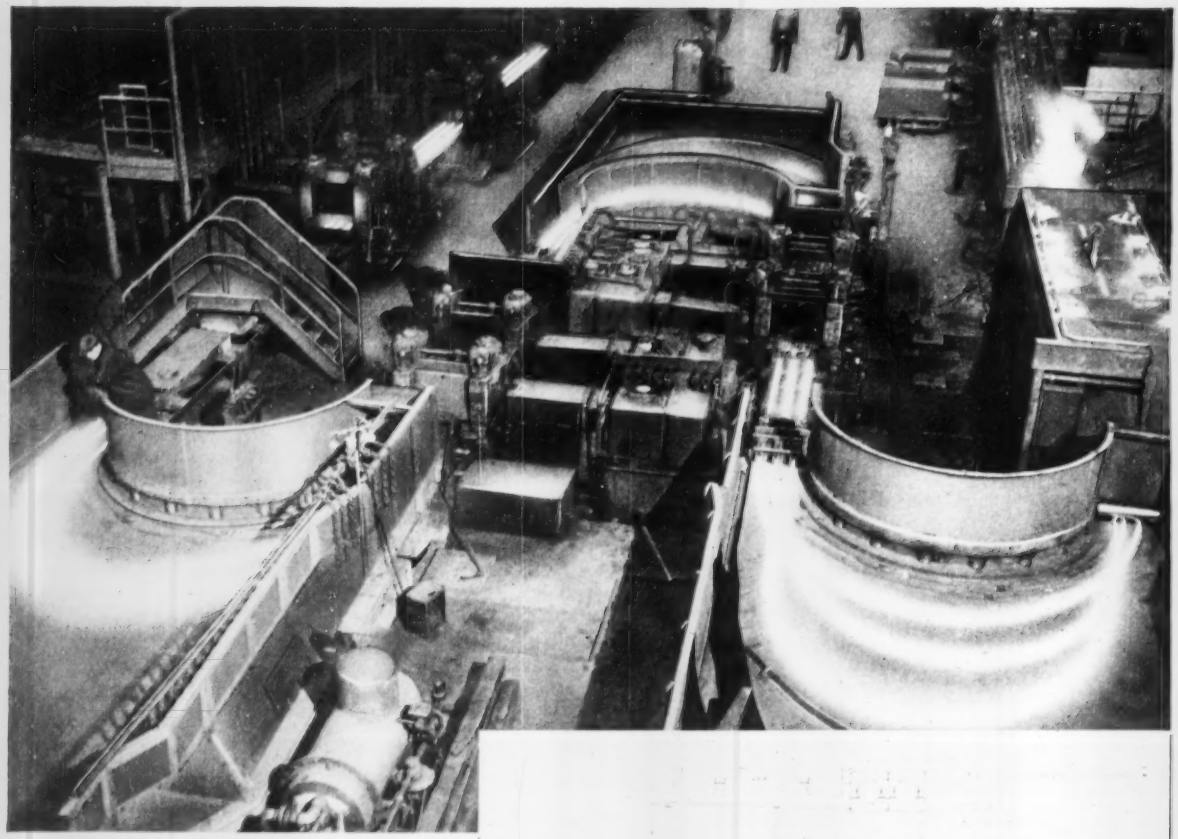
Carbon	0.90	Chromium	0.50
Manganese	1.20	Vanadium	0.20
Tungsten	0.50		

BTR combines abrasion-resistance and toughness, making it suitable for a wide variety of tool and die applications.

• • • • • • • •

Big Babies Turn Out Shell Discs

This huge multiple punch and die set blanks 90 mm shell discs, 8⅝ in. in diameter, from .500 gage, C 1030 plate steel. The punches and dies are made of A H6 tool steel, hardened to Rockwell C 58 to 60. They turn out about 1,500 pieces in an 8-hour turn, and require but a minimum of redressing. A H6, our 5 per cent chrome, air hardening steel, is well known for durability, minimum distortion in heat treatment and easy machining.



top quality rod
at better than
50 miles per hour

Roll Neck as installed in United's Rendleman Mill at Jones & Laughlin. Dotted lines show oil passages for quick, easy bearing removal by the [redacted]-pioneered Hydraulic Removal System.

[redacted] multi-row cylindrical bearings installed on the roll necks of the Jones & Laughlin Rendleman rod mill by United Engineering and Foundry Company, are doing an outstanding job at mill speeds of 4700 feet per minute.

The [redacted] multi-row cylindrical bearing was specifically designed for roll neck applications. This four row grease lubricated bearing incorporates all those necessary qualities for the highest standards of roll neck bearing performance long desired by mill builders.

This is another example of [redacted] leadership in the rolling mill field. Consult [redacted] and have *them* help *you* "put the right bearing in the right place."

SKF INDUSTRIES, INC., Philadelphia 32, Pa. — *manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.*

7405

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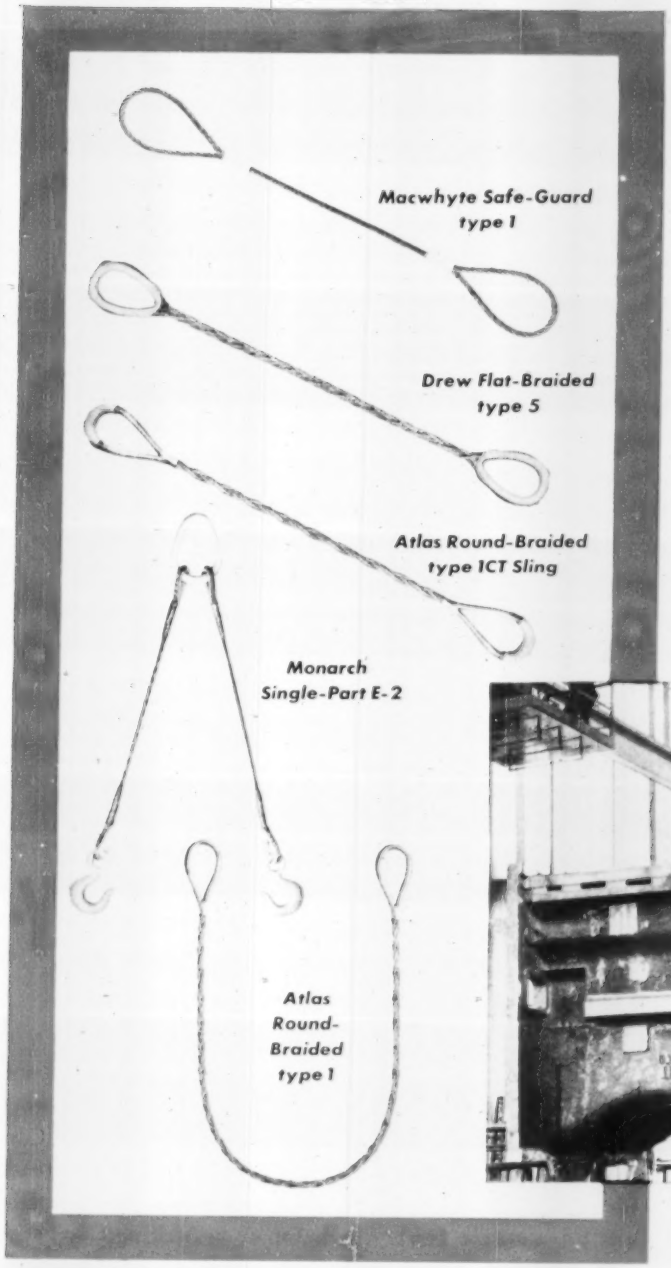
BALL AND ROLLER BEARINGS


Macwhyte Safe-Guard type 1
Drew Flat-Braided type 5
Atlas Round-Braided type ICT Sling
Monarch Single-Part E-2
Atlas Round-Braided type 1

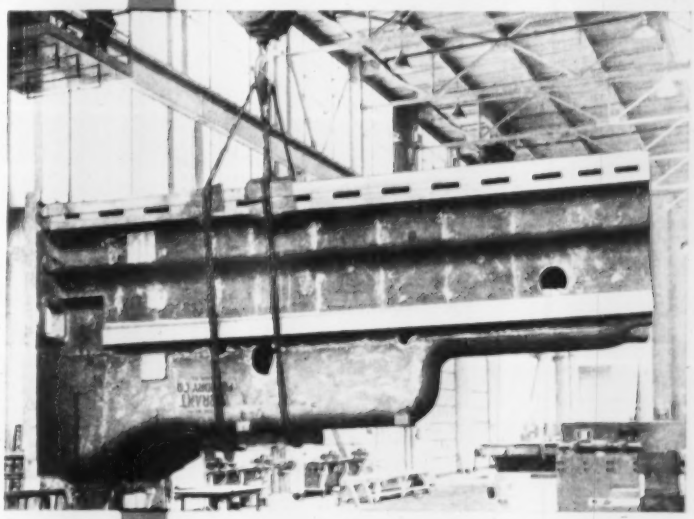
Macwhyte Slings

any type . . . any size your job requires

Here are some of the hundreds of slings available to you. Macwhyte slings cover a full range of sizes and designs in three body types: round-braided, flat-braided, single-part. These slings are made to order with fittings needed.

For greater flexibility, safer gripping, and longer sling life, Macwhyte *Atlas* Slings are "balanced-braided" and (1) Ropes are spliced endless before braiding. (2) Right lay ropes balance left lay ropes. (3) All ropes follow uniform spiral paths, assuring balanced tension throughout the sling body. And under load, there's no kinking . . . no spinning in an *Atlas* Braided Sling.

Macwhyte engineers will study your sling needs and give you the benefit of their broad experience. Ask for recommendations and quotations.



Macwhyte MONARCH Cable Laid Grommets handling large casting

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Ortac—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

GIVING STEEL THE ONCE-OVER-LIGHTLY-

calls for ORTAC HOSE

PUTTING the finishing touch on a steel mold is a delicate operation. The mold maker must have complete freedom of movement—complete control over the grinder. That's why the G.T.M.—Goodyear Technical Man—specifies ORTAC for this exacting work.

ORTAC is vertically braided with double end rayon cord. This type of reinforcement gives it high strength, lightness and extreme flexibility. It readily responds to the slightest command, yet is an unusually durable, safe, economical hose—ideally suited to light and medium pneumatic tool service.

And that's not all. This hose can be used for a variety of purposes. ORTAC means "Oil Resistant Tube and Cover." It can handle air, water, oil, gasoline and most solvents. This one hose does the work of five. Can you use ORTAC? Contact your G.T.M. You can reach him through your Goodyear Distributor or by writing Goodyear, Industrial Products Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing or Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

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This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 134 No. 16 April 19, 1954

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

Metalworking Outlook 85

As the Editor Views the News 89
Editor-in-Chief E. L. Shaner gives his thought-provoking views on matters of interest to the metalworking industry

Windows of Washington 100

Where the Steel Went in 1953 104
A statistical survey of finished steel products by market classification

Mirrors of Motordom 107

The Business Trend 111
Follow the course of business activity in charts and on the industrial production index

Men of Industry 115

Tooling for Competition 135

The Tool Engineer Moves Up 136
New role involves same problems and decisions, but now he's consulted before top-level decisions are made

Tips To Lower Tooling Costs 138
Whims and arbitrary specifications show on tooling bill. An expert discusses this needless expense

Tool and Die Forum 140
Cost-conscious users are imposing new tool and die requirements. Suppliers comment on economy picture

ASTE Program of Conferences 150

ASTE Exhibitors 168

New Products and Equipment 195

The Market Outlook 207
Metal Prices and Composites begin on Page 208

Nonferrous Metals 210

Behind the Scenes	6	Foreign News	103
Letters to the Editors	10	Obituaries	113
Calendar of Meetings	25	Helpful Literature	205

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(Advertisement)

Producers Pare Stamping Costs

Modern Coil Handling Equipment Widens Use of Low Cost Coil Stock

The battle to keep down costs is going well for producers of stampings. Coil stock and modern coil handling equipment are the decisive factors. Coil stock, with only two scrap ends to its entire length is far more economical than strips of straight stock with two scrap ends to every ten feet. Moreover, the type of coil loading and handling equipment built by F. J. Littell Machine Co. makes coil stock easier to handle than straight stock. Stamping producers are taking full advantage of these developments. Coil stock and Littell Coil Hooks, Reels, Straightening Machines and Automatic Roll Feeds are in wider use today than ever before.

Hooks Serve Two Ways

. . . Littell Hooks make it a simple matter to unload coils on delivery, and to load reels. The variety of sizes have lifting capacities from 1,000 to 40,000 pounds.

Two Types of Reels . . .

Littell Coil Cradle Reels mount heavy coils, up to 30,000 pounds. Spindle Reels handle coils up to 40,000 pounds. Each types is available in plain or motor driven designs.

Straighteners Flatten Stock . . . Removing curvature from coil stock as it passes from reel to punch press die is the function of Littell Straightening Machines. All models are the same basic design. Variation is in the number and diameter of straightening rollers employed . . . from 1" to 60" in width, and from .010" to .125" thickness.

Automatic Roll Feeds . . . Press output in many shops has been multiplied five times by simply attaching Littell Roll Feeds to presses for blanking, drawing, piercing, or cut-off work. The Littell Roll Feed is used with compound dies, single station dies, and progressive dies. Standard models are easily attached, serve all types of presses, and handle all standard widths and thicknesses of stock.

Descriptive details and prices on Littell Hooks, Reels, Straighteners and Roll Feeds are available on request. Inquiries are given immediate attention when addressed to

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Pawtucket eye bolts are made in standard sizes ¼" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit.

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THE PLACE TO SOLVE YOUR BOLT PROBLEMS

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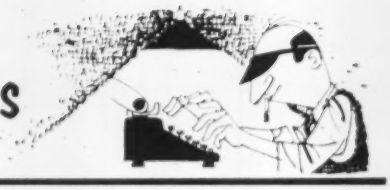
behind the scenes



Thank You, Mr. Worfolk

"I'm no mathematical wizard or warlock" writes Mr. Carlton F. Worfolk of Algonac, Mich., "just a 71-year-old free-lance writer mostly mechano-technical stuff who keeps his mind young and on the beam by, among other things, scrupulously perusing STEEL, which I consider among my indispensables."

"My wife, who like myself is not young anymore, was not feeling very well this sunshiny-in-Algonac April morning, so I read to her your woodpecker yarn to cheer her up. She managed to get a good laugh out of it. THANK YOU!"

THANK YOU!, Mr. Worfolk, for telling us about it. The smile our wacky words were able to bring to the face of your missus is the most important single accomplishment of our writings to date. Good luck and good health to you both. We'll pass your inquiry on the Heavyside Operational Formula on to one of our technical friends who can read calculus. You do read the stuff, don't you?

About the May 10 Issue

STEEL's May 10 issue is going to be devoted to bringing you a complete preview of the Basic Materials Show in Chicago, May 17-20.

Irwin Such, STEEL editor, tells us that four important features are being planned for this issue. They are:

1. Plan for Profit with Improved Metals and Alloys — a stimulating article which will attempt to drive home the idea that one very important step to increased profits is the selection of the right material for the job to be done.

2. Metal Selection Chart — a handy, easy-reference chart including this *never before* type of information:

a. Latest revised information on engineering alloy and H-steels, including standard, tentative standard and boron grades. These specifications, we are told, will become standard for all government departments and the armed services.

b. A specially prepared list of copper-base alloys showing analyses and properties.

c. Complete listing of aluminum and magnesium grades including producer designations, compositions and principal uses.

d. New additions to the list of titanium alloys now commercially available, plus all previously existing specifications.

3. Five Technical Articles on Materials:

a. Engineering Alloy Steels

b. Trends in Development and Use of Copper-Base Alloys

c. Trends in Development and Use of Light Metals

d. Stainless Steels: How Type Selected Affects Fabrication

e. Now You Can Use Titanium: It's No Longer a Laboratory Curiosity!

4. The Basic Materials Show:

Complete program of meetings and events including: Materials of the Future; Corrosion; New Metal Forming Processes; How, When, Where to Use Non-metallic Materials; Joining and Materials Management. Also, complete listing of exhibitors and where to find them at the International Amphitheater.

There's a quick outline of an issue we think you'll find most useful. Remember, May 10 is its publication date so be on the lookout for it.

Get Your Copy Now

Say, you can get copies of that recent series of STEEL articles on leasing by dropping a quick note to the Readers' Service Department. The final installment appeared in last week's issue and the trio of articles has been packaged into reprint form.

If you want a copy, better write now. From all advance indications, they're going to go fast.

Shirley

(Metalworking Outlook Page 85)

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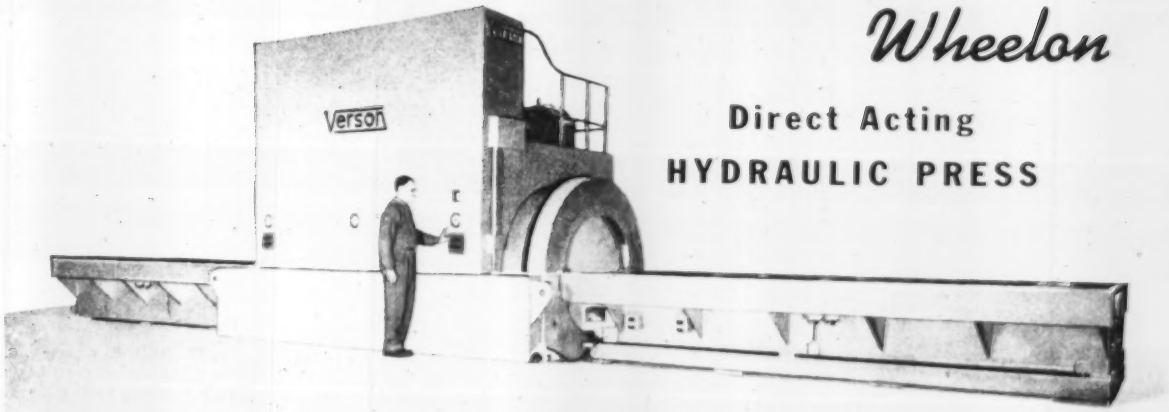

The Verson-Wheelon Bulletin explains the simple operation of the Verson-Wheelon Press and shows examples of the work it performs. Typical specifications are also given. It is available on request.

Yes, this Verson-Wheelon Press has a capacity equivalent to a 21,000 ton rubber pad forming press. However, it does a better, more complete forming job than the rubber pad press; yet its cost is only a fraction of that of the conventional press.

The Verson-Wheelon Press illustrated operates at 5,000 psi. Its twin feeding tables are each 50" x 168" to handle long channels for a leading aircraft manufacturer.

If you are now doing or contemplating rubber pad forming, you should consider a Verson-Wheelon Press before you buy. Compare the price and compare the work—it's the best way to convince yourself of the economy of Verson-Wheelon forming. The bulletin described at the left gives full information. Write for your copy, today.

A Verson Press for every job from 60 tons up.

TRADE **Verson** MARK

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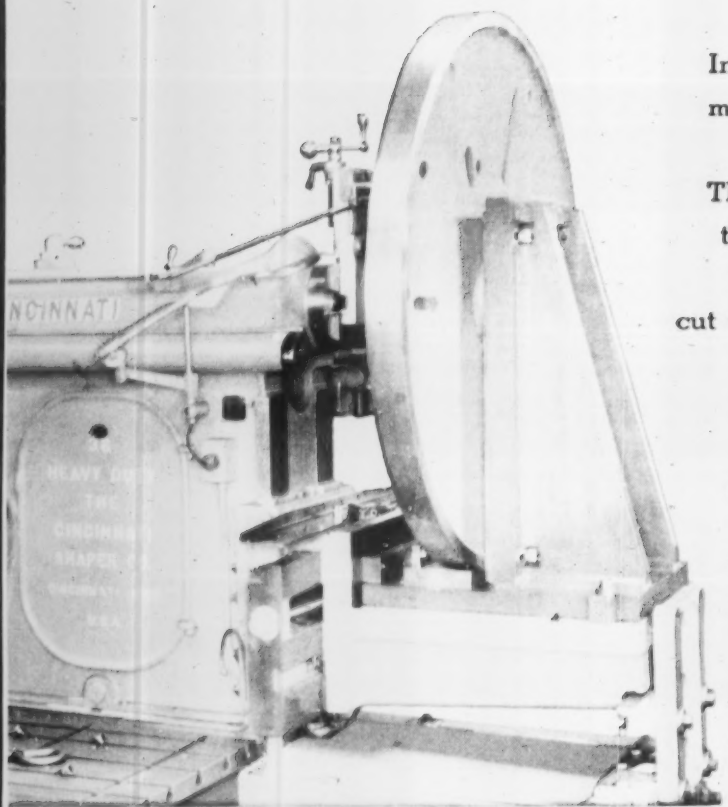
INTERNAL SHAPING

the LARGE



Internal shaping is the only practical method for many "hard to get at" jobs.

This large job is especially adaptable to this rigid Cincinnati Shaper with "drop" table. Kennedy keyways are cut to .0005" tolerance in this big gear. The low cost fixture and tool make this job profitable and simple.

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- Internal contouring.
- Internal teeth on special gears.
- Internal guides in gate valves.
- Internal slotting.

Write for New Cincinnati Shaper Catalog N-6.

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job

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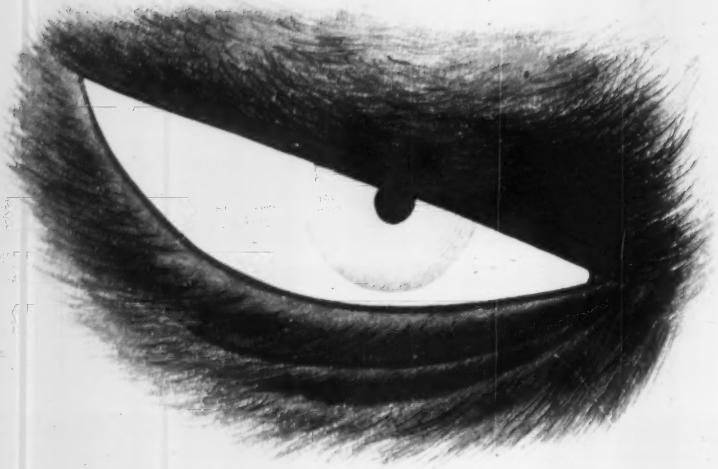

Like an evil eye, fire is constantly on the lookout for unprotected hazards such as flammable liquids, electrical equipment, materials in process. Get protection that never sleeps. Guard every hazard in your plant with a Kidde Automatic Fire Extinguishing System.

Quick as a wink, check the 'yellow pages' for your local Kidde dealer.

Kidde

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LETTERS TO THE EDITORS

Rumors Reach the Editors

I want to say a word of congratulation on your Mirrors of Motordom column about rumors (Mar. 22, p. 55). Inasmuch as I have spent a good share of my time at Studebaker denying this, that and the other rumors that have sprung up, I feel it high time that such stories be spiked as you have done.

In addressing a local group here several weeks ago, Harold Vance, Studebaker chairman, said there was only one factory in South Bend working a three-shift day, seven-day week—the rumors factory.

W. R. Walton
director public relations
Studebaker Corp.
South Bend, Ind.

Complete Table on Titanium

We would like very much to obtain a copy of the complete list of the various annealed titanium and titanium alloys and who makes them, which was contained in your Oct. 12, 1953, issue, p. 170.

Frank G. Frink Jr.
vice president
Washington Iron Works
Seattle

• *Tear sheets of that table have been sent. However, a new table of titanium alloys now commercially available plus all previously existing specifications is being prepared for* STEEL*'s May 10, 1954, issue. A copy will be sent when available.—ED.*

Instrument Unscrambles Metal

In the Mar. 15 issue there is described on p. 59 an instrument that unscrambles mixed metal parts which is manufactured by the General Motors Corp. We are interested in this product. Will you kindly advise which division of General Motors manufactures this unit?

Frank E. Ward
purchasing agent
Manufacturing Division
Chicago Pneumatic Tool Co.
Garfield, N. J.

• *For further information on the instrument, the Thermoelectric Metal Comparator, write to the General Motors Research Laboratories, Box 188, North End Station, Detroit.—ED.*

Rate Cut Exceptions

We are tremendously interested in your article "Railroads Fight for Steel" (Mar. 22, p. 39), dealing with the reduced railroad freight rates in the Of-

(Please turn to page 12)

Announcing

THE WORLD'S MOST COMPLETE LINE

NEW Starrett

HIGH PRECISION — LOW FRICTION

DIAL INDICATORS

(Patents Pending)

NOW, from the pioneers in precision measuring, comes a new line of dial indicators combining improved design with all the dependable features of previous models, long known and accepted throughout industry for their accuracy and precision workmanship. Precision built throughout to American Gage Design specifications the complete new Starrett line offers *140 models* to meet every requirement. New design, with outstanding new features to insure greater accuracy, sensitivity and repeatability; easier, faster reading; longer life and simplified maintenance — these are the finest indicators ever to carry the Starrett name.

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- **LONG RANGE MODELS** — All long range indicators are *direct reading* . . . count hands read directly in decimals — no calculations.

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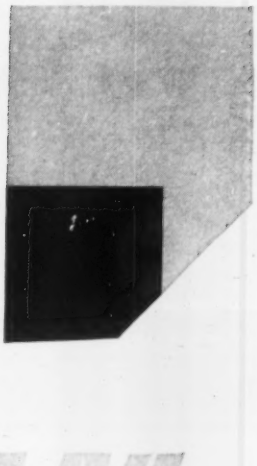

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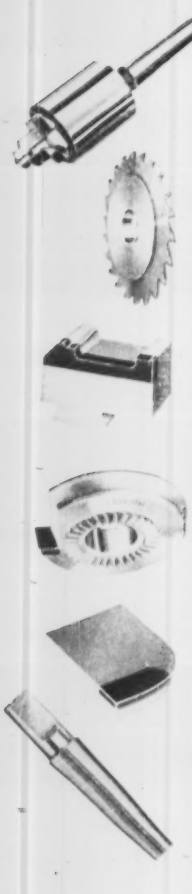

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LETTERS

(Concluded from page 10)

ficial Territory on certain iron and steel articles.

It is our understanding these reduced rates were made applicable on items which tended more readily to motor freight transportation and attracted the motor freight competition. In your article "structural shapes" is shown as taking these reduced rates. All the information we can get definitely exclude structural shapes.

M. E. Robinett
traffic manager
Bristol Steel & Iron Works Inc.
Bristol, Va.

• *You are correct—most structural shapes do not take the new reduced rail freight rates. We should not have used the term structural shapes because that is too broad, a term to describe the "shapes unfinished as described under blanks" which were included in the rate reductions.—ED.*

Refer to STEEL Story

In the last three weeks I have had several calls from people (who had not read STEEL) in distress over distortion in weldments.

I quickly referred them to your article "Distortion Can Be Designed Out" (Mar. 8, p. 120).

Soon I am to go to the 6th annual spring engineering meeting, American Institute of Steel Construction in Milwaukee. While "distortion due to welding" is not on the printed program, I am certain that it will come up for discussion. Again, I can refer to STEEL.

J. R. Stitt
research & welding engineer
R. C. Mahon Co.
Detroit

Thermocouple Gets a Coat

In the Mar. 29 issue we noted the Technical Outlook item "Thermocouple Protection" (p. 101) about a protective coating for cast iron thermocouple tubes developed by the Barrows Porcelain Enamel Co. We are very much interested in this development but have been unable to find the address of that company. Please advise.

Robert W. Eck
Eck Foundries Inc.
Manitowoc, Wis.

I would like very much to contact the right party on this coating.

Russell H. Coonce
purchasing agent
Rupert Inoculating Co.
Kansas City, Mo.

• *It's Barrows Porcelain Enamel Co., Langdon and Wiehe Roads, Cincinnati 13.—ED.*

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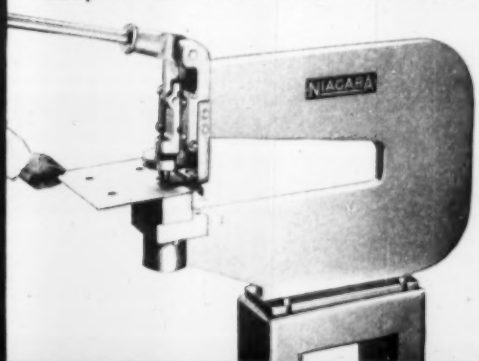

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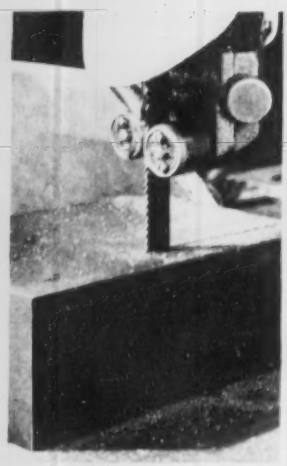

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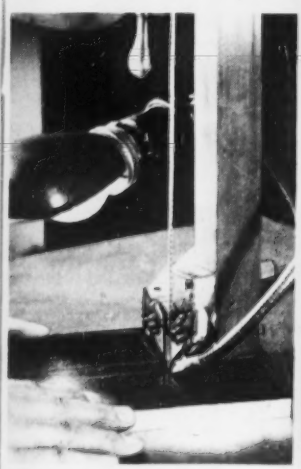

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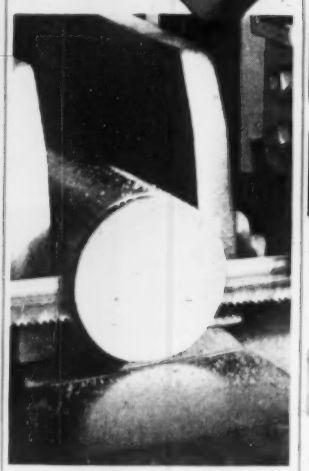

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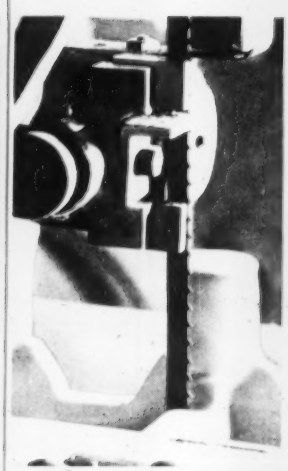

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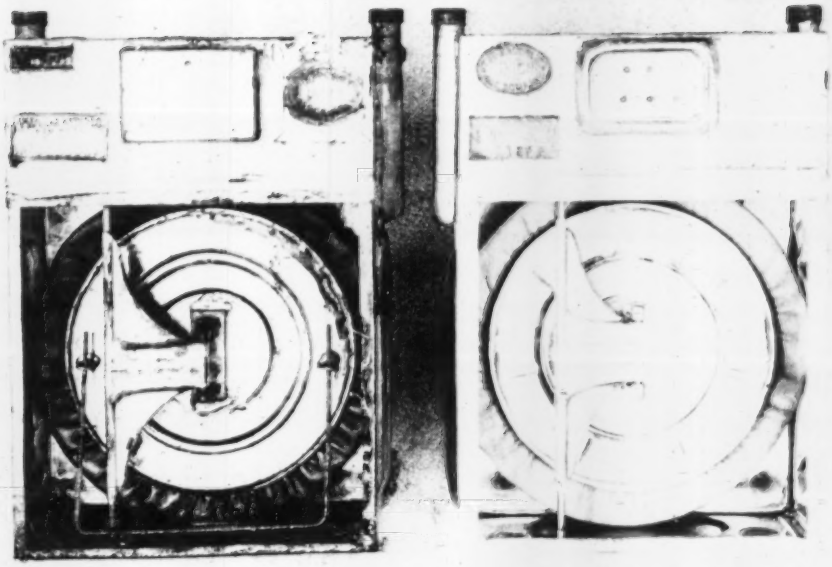

500 METERS A DAY are cleaned in this conveyorized degreaser. "Trichlene" D vapors clean thoroughly, leave meters warm and dry, instantly ready for inspection.

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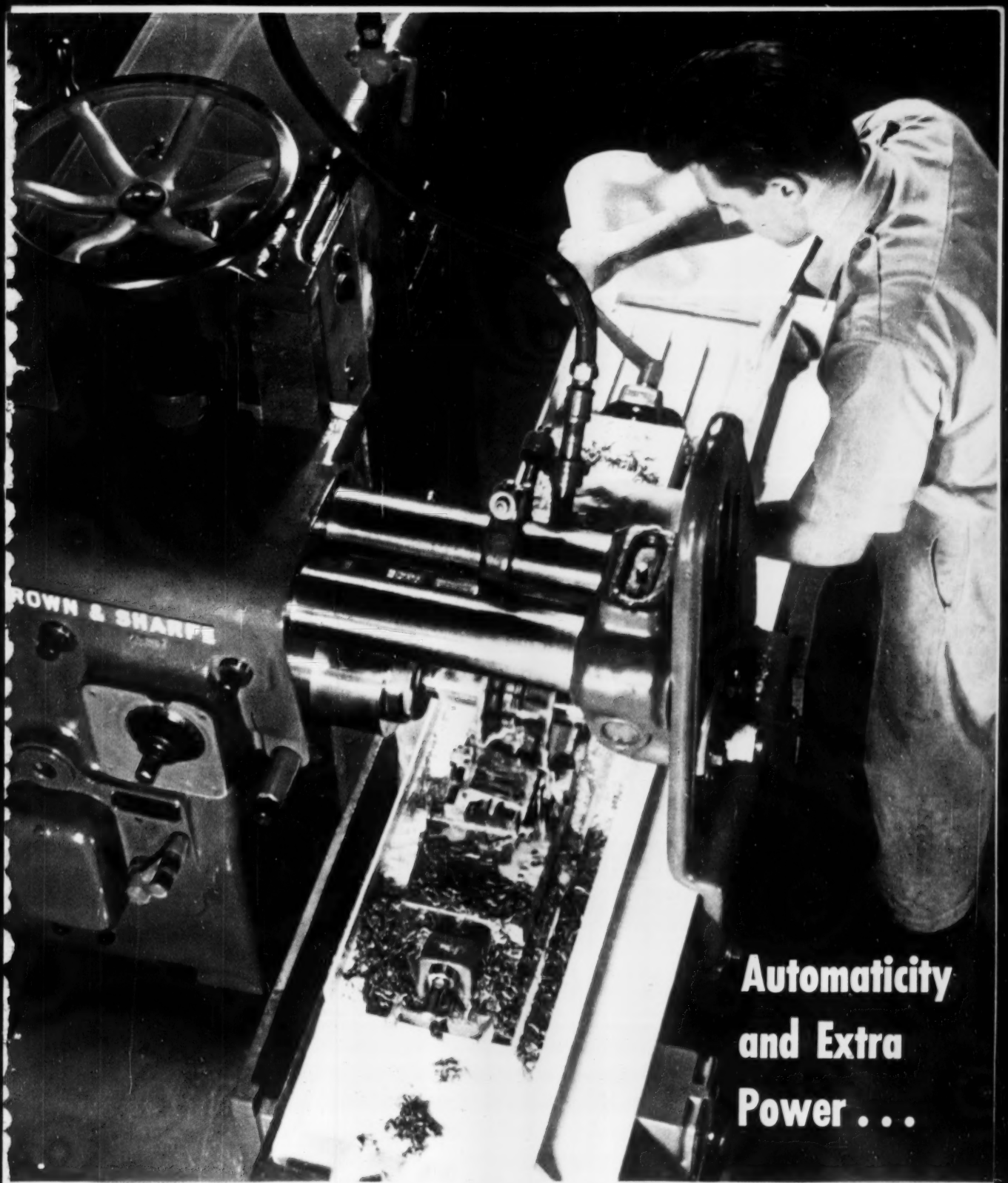

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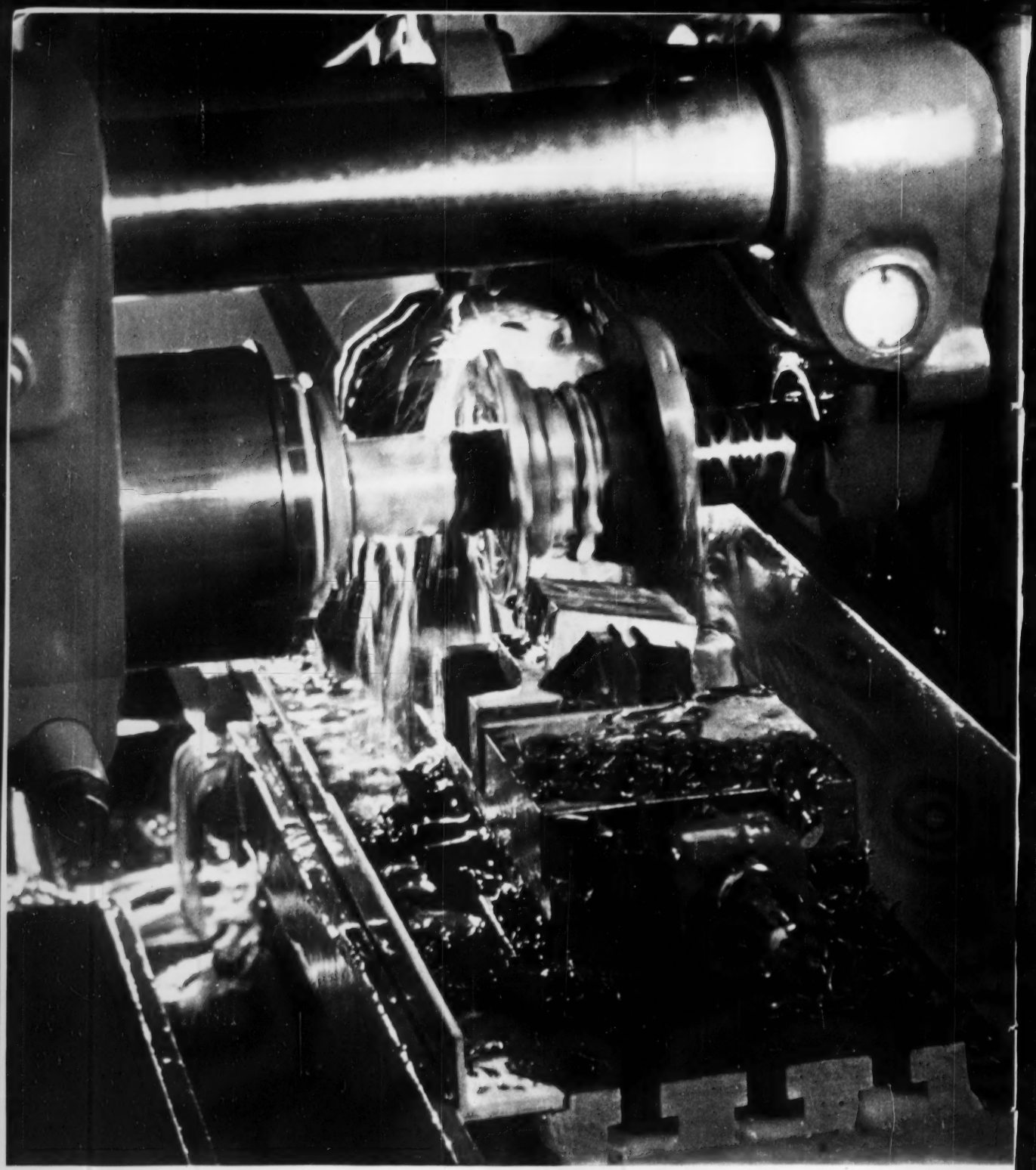

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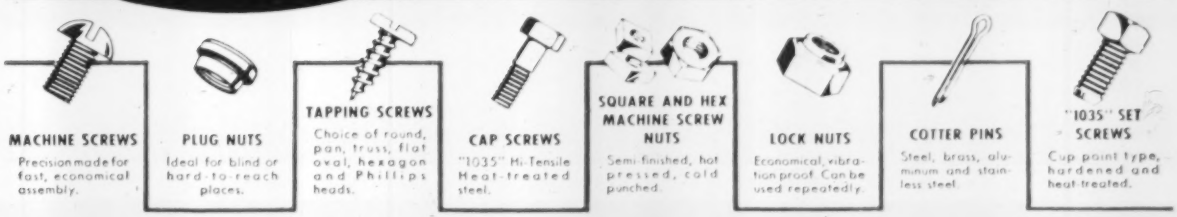

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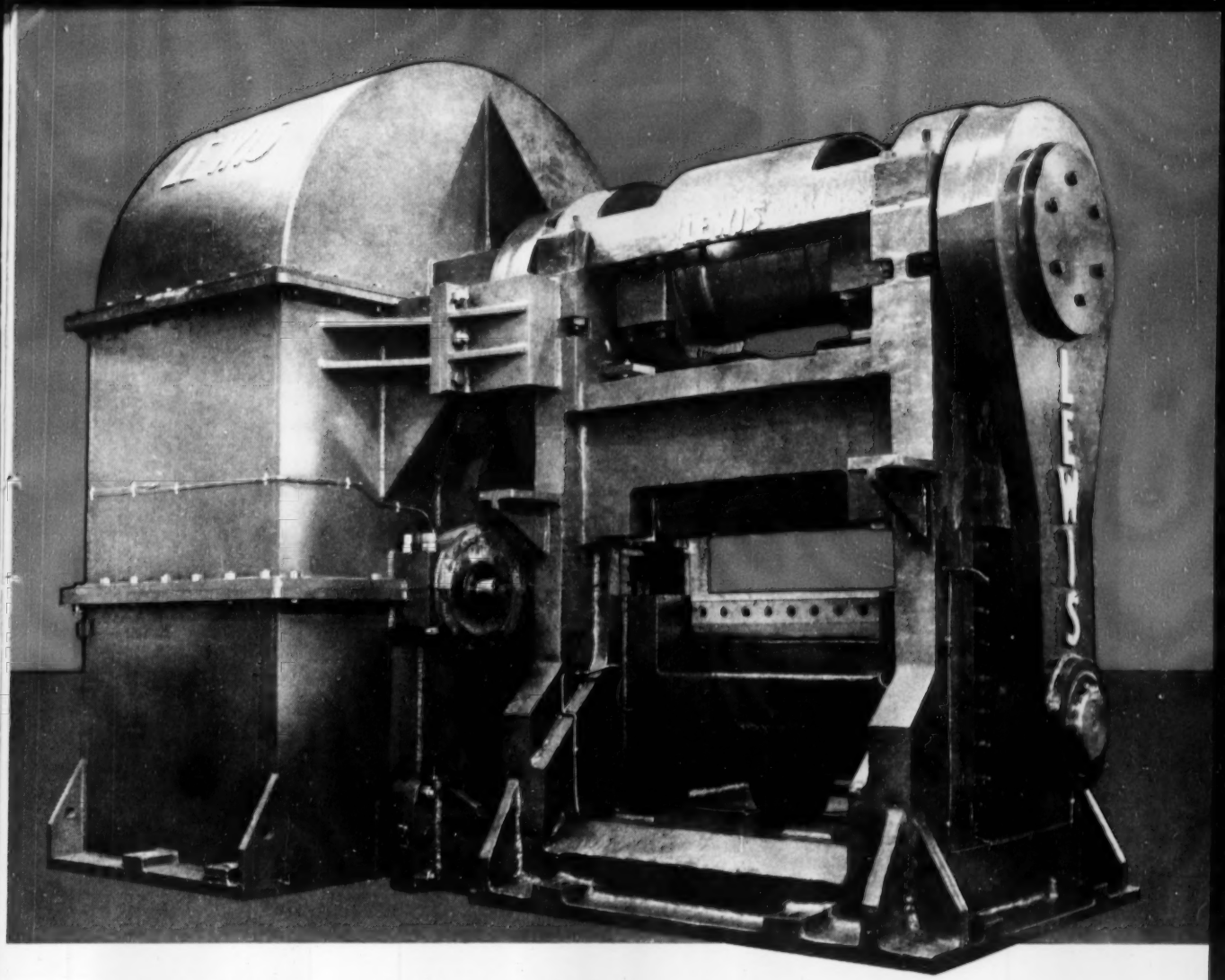

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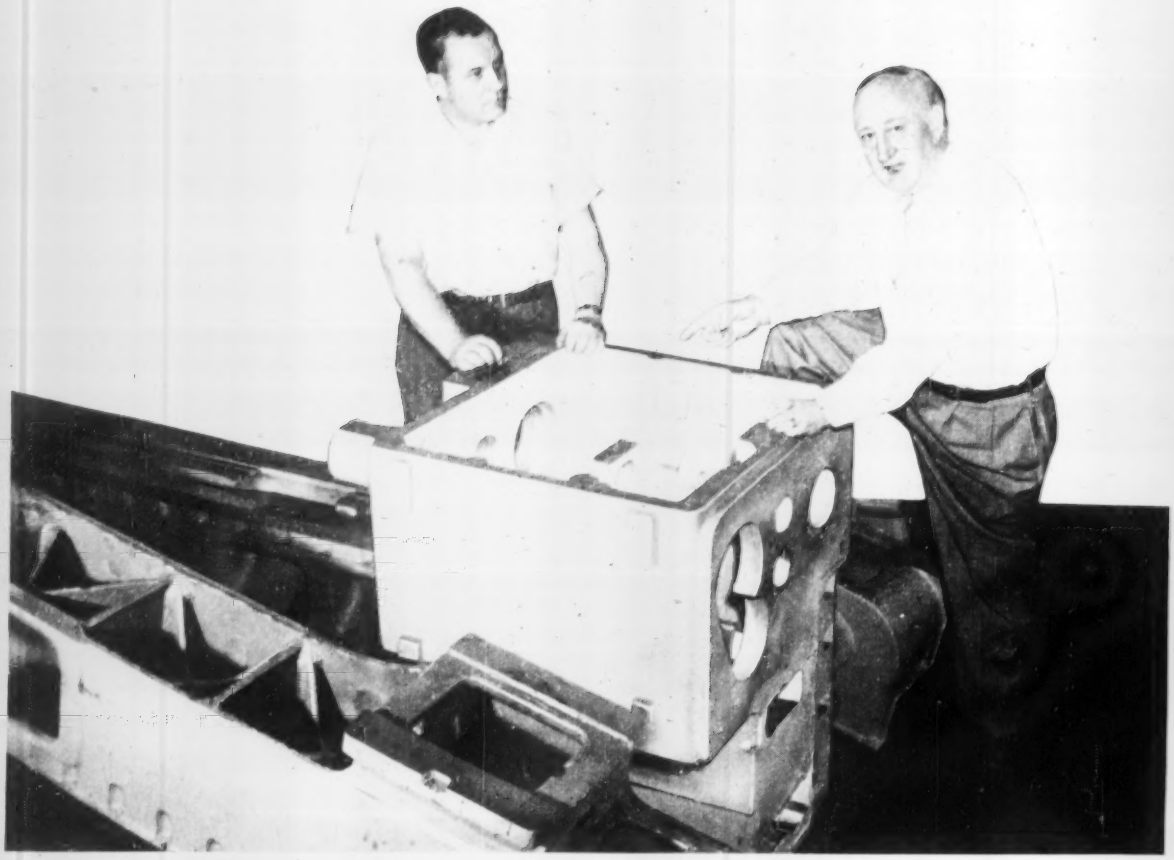

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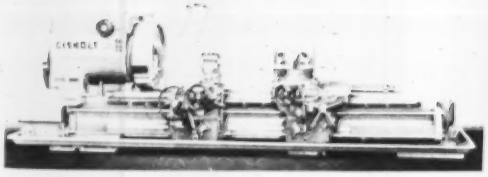

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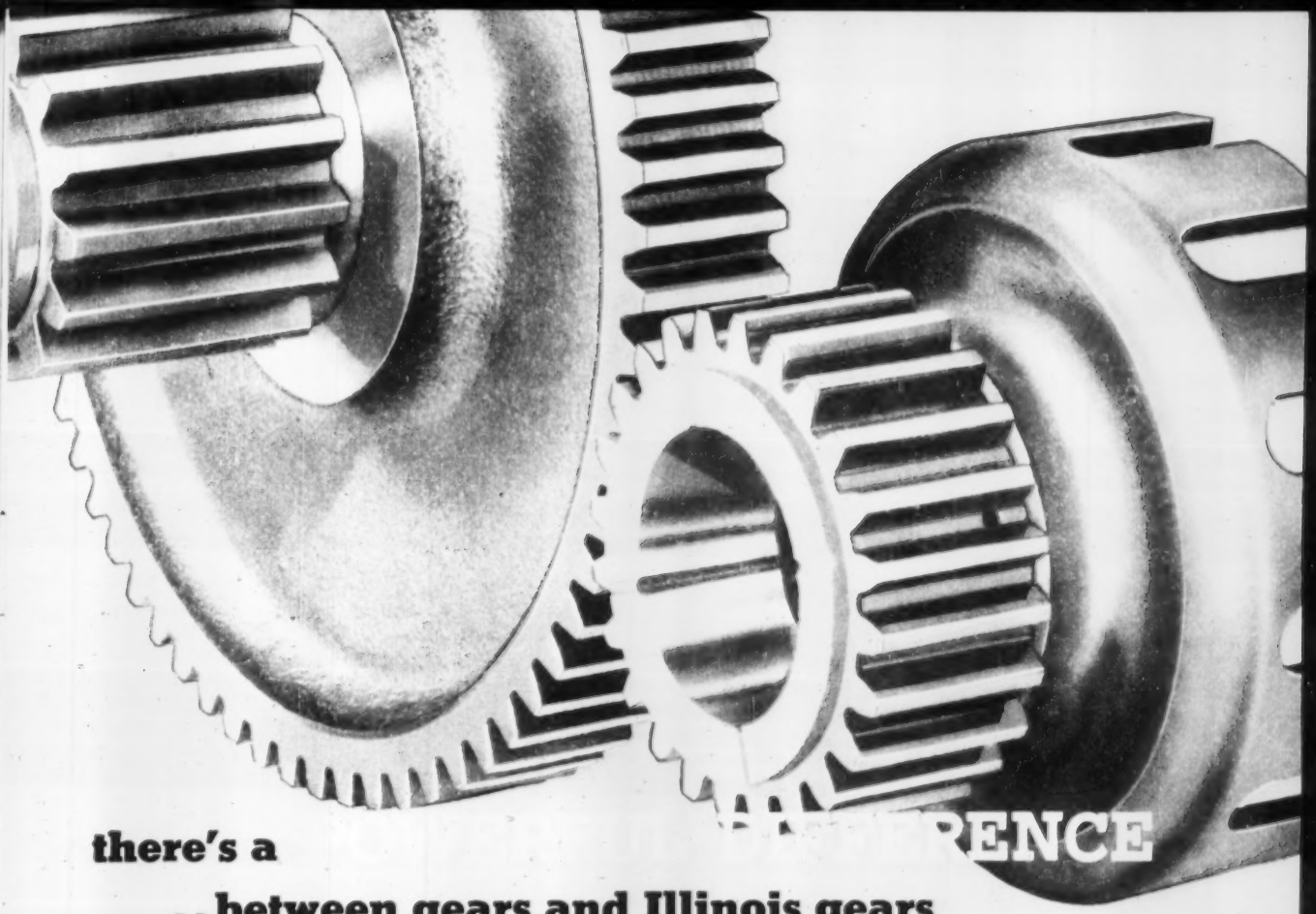

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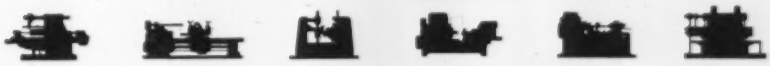

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For taming hard-to-roll steels...

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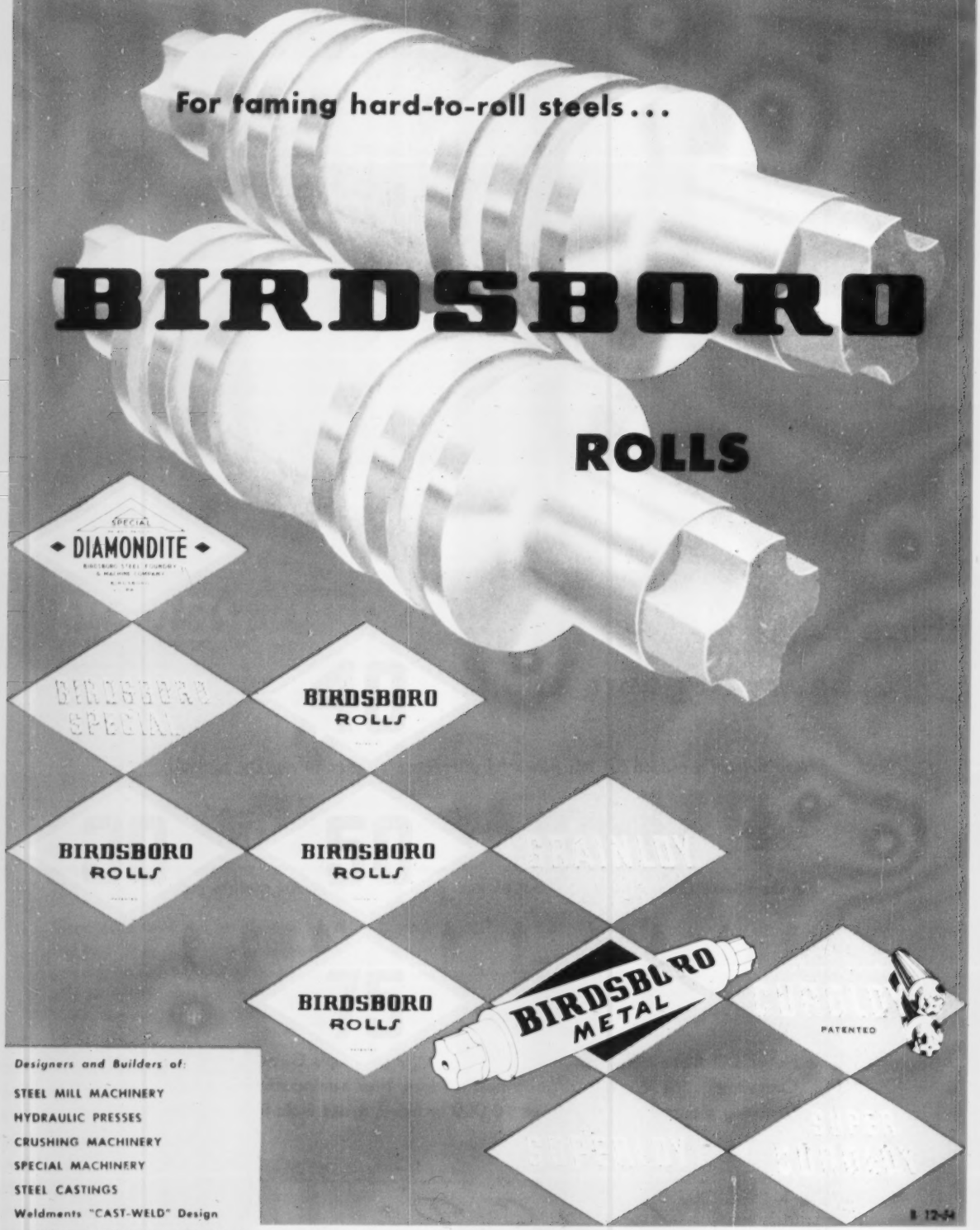
ROLLS



Designers and Builders of:

STEEL MILL MACHINERY
HYDRAULIC PRESSES
CRUSHING MACHINERY
SPECIAL MACHINERY
STEEL CASTINGS
Weldments "CAST-WELD" Design
ROLLS: Steel, Alloy Iron, Alloy Steel

B 12-54

IRON BASE ROLLS: Grainloy, Birdsboro Metal, Curoloy, Superloy, Super Curoloy
STEEL BASE ROLLS: Diamondite, Birdsboro Special, Birdsboro "30", "40", "50", and "75"

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. Offices in Birdsboro, Pa. and Pittsburgh, Pa.

CALENDAR
OF MEETINGS

April 18-23, American Ceramic Society Inc.: Annual meeting, Palmer House, Chicago. Society address: 2525 N. High St., Columbus 2, O. Secretary: Charles S. Pearce.

April 20, Conference on Instrumentation in Water, Sewage and Industrial Waste Treatment, Manhattan College, sponsor. Information: Civil Engineering Dept., Manhattan College, New York 71.

April 20-21, American Zinc Institute Inc.: Annual meeting, Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary: E. V. Gent.

April 21-23, American Institute of Electrical Engineers: Annual conference on feedback control systems, Hotel Claridge, Atlantic City, N. J. Information: G. L. Stancliff Jr., Vickers, Inc., 723 - 15th St., NW, Washington.

April 21-23, National Screw Machine Products Association: Annual meeting, Hotel Statler, Detroit. Association address: 2860 E. 130th St., Cleveland 20. Executive secretary: Orrin B. Werntz.

April 22-23, Lead Industries Association: Annual closed meeting, Drake hotel, Chicago. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 22-23, The Wire Association: Annual regional meeting, Hotel Sheraton, Worcester, Mass. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

April 22-24, American Society for Metals: Annual lower lakes regional conference, Hotel Seneca, Rochester, New York. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

April 23-24, National Association of Cost Accountants: Richmond regional conference, Hotel John Marshall, Richmond, Va. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnerson.

April 26-28, American Management Association: Manufacturing conference, Hotel Statler, Cleveland. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

April 26-28, Metal Powder Association: Annual open meeting and exhibit, Drake hotel, Chicago. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 26-30, American Society of Tool Engineers: Convention and industrial exposition, Convention Center, Philadelphia. Society address: 10700 Puritan Ave., Detroit 21. Executive secretary: H. E. Conrad.

April 26-30, Industrial Health Conference: Hotel Sherman, Chicago. Information: Publicity Committee, 1954 Industrial Health Conference, 205 N. La Salle St., Chicago 1, Ill.

April 28-May 1, Grinding Wheel Institute and Abrasive Grain Association: Spring meeting, The Homestead, Hot Springs, Va. Information: Hunter-Thomas Associates, 2130 Keith Bldg., Cleveland 15.

May 2-4, American Steel Warehouse Association: Annual meeting, Hotel Drake, Chicago. Association address: 442 Terminal Tower, Cleveland 13. President: Walter S. Doxsey.

May 2-4, National Tool & Die Manufacturers Association: Board of trustees and committee meeting, Hotel Statler, Washington. Association address: 907 Public Square Bldg., Cleveland 13. Executive secretary: George S. Eaton.

May 3-4, American Management Association: Special conference on capital equipment replacement, Hotel Commodore, New York. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

May 3-5, American Mining Congress: Coal convention, Hotel Netherland Plaza, Cincinnati. Congress address: 1102 Ring Bldg., Washington 6. Executive vice president: Julian D. Conover.

May 3-5, Association of Iron & Steel Engineers: Spring meeting, Bellevue-Stratford hotel, Philadelphia. Association address: 1010 Empire Bldg., Pittsburgh 22. Managing director: T. J. Ess.

Socket Screw Products by WESTERN
Insure Fast, Economical Assembly

Western Socket Set Screws are available in cup point, cone point, flat point, oval point and half-dog.

Western Socket Cap Screws are "traction-knurled" for faster assembly.

Western Stripper Bolts, like other Western Socket Screw products, have rust-resistant black oxide finish.

Western Socket Keys are available singly or in 3 kit sizes individually packed in attractive cloth or plastic cases.

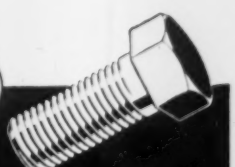
Western Socket Pipe Plugs, made of special electric furnace alloy steel, are available in pipe sizes from 1/16" to 1-1/4"

You get faster assembly of your products *plus* modern, streamlined appearance — with no protruding bolt heads — when you specify, "Western Socket Screw Products."

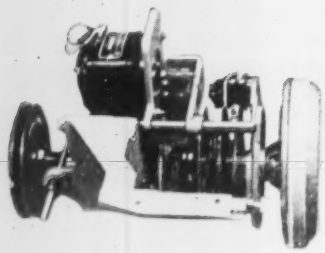
Flush-to-surface Socket Screw Products by Western are made of alloy steel, carefully processed on the most modern heading and threading equipment and heat treated in electric atmosphere-controlled furnaces. Precision made, they fit instantly — saving assembly time and money.

Write today for free catalog and prices.

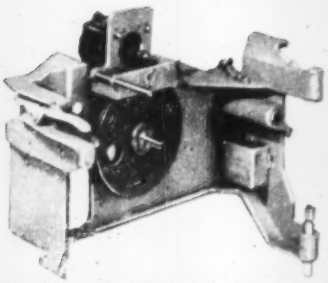
Western Automatic
Machine Screw Company
377 Lake Ave., Elyria, O.



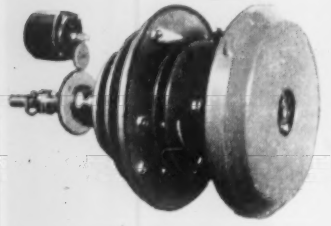
Precision Screw Products, Parts and Assemblies Since 1873



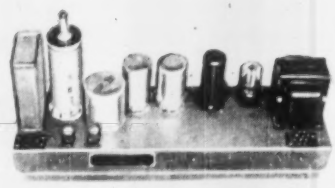
Reserve Power. Speedomax can operate at any speed from a whiz to a saunter, because balancing motors are two to four times more powerful than in any other present-day electronic controllers. A heavy load of control and signal cams makes no difference. The long Speedomax shaft and big case can accommodate a worlds-record assortment of such accessories.



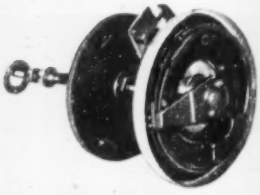
Reserve Construction. You may think all instruments are "delicate", until you look at a Speedomax. Then you'll see forgings and castings instead of stampings; cut, heat-treated gears instead of cast; ball bearings instead of sleeves. You'll see aluminum used, to save weight; parts made extra-strong to prevent deflections. You'll see, in detail after detail, how rigid construction gives rigid dependability.



Locked-in Synchronism. Synchronization of control, recording and signalling actions is permanently fixed because their actuating cams are "locked on a common shaft. Obvious? Yes, but in this field a Speedomax exclusive.



Reserve Sensitivity. A change of one tenth of one percent of the range is picked up by Speedomax. The instrument therefore, never strains to keep its readings precise, even when the range is short.



Reserve "Cleanness" Speedomax has superb filtering and (when needed) shielding, but neither can guarantee that the electronic recorder's circuit will be unaffected by electronic "junk" from nearby motors, or other equipment. So, we provide a unique "clean" circuit design—and thereby cancel the junk that would otherwise slow down the balancing motor. Net effect is snappy and accurate recording action.

SPEEDOMAX®

"Reserves"

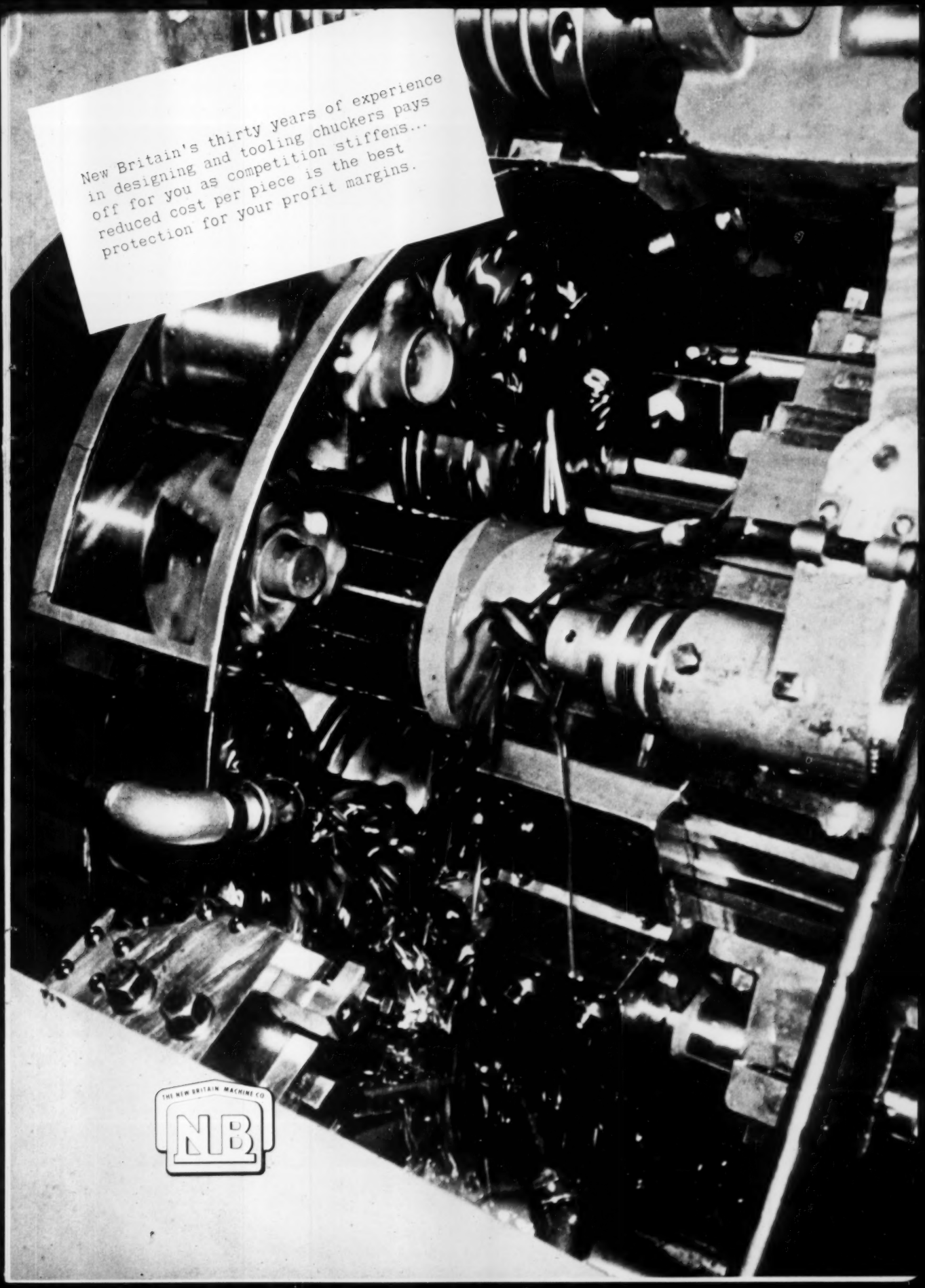
ARE ALWAYS ON THE JOB!

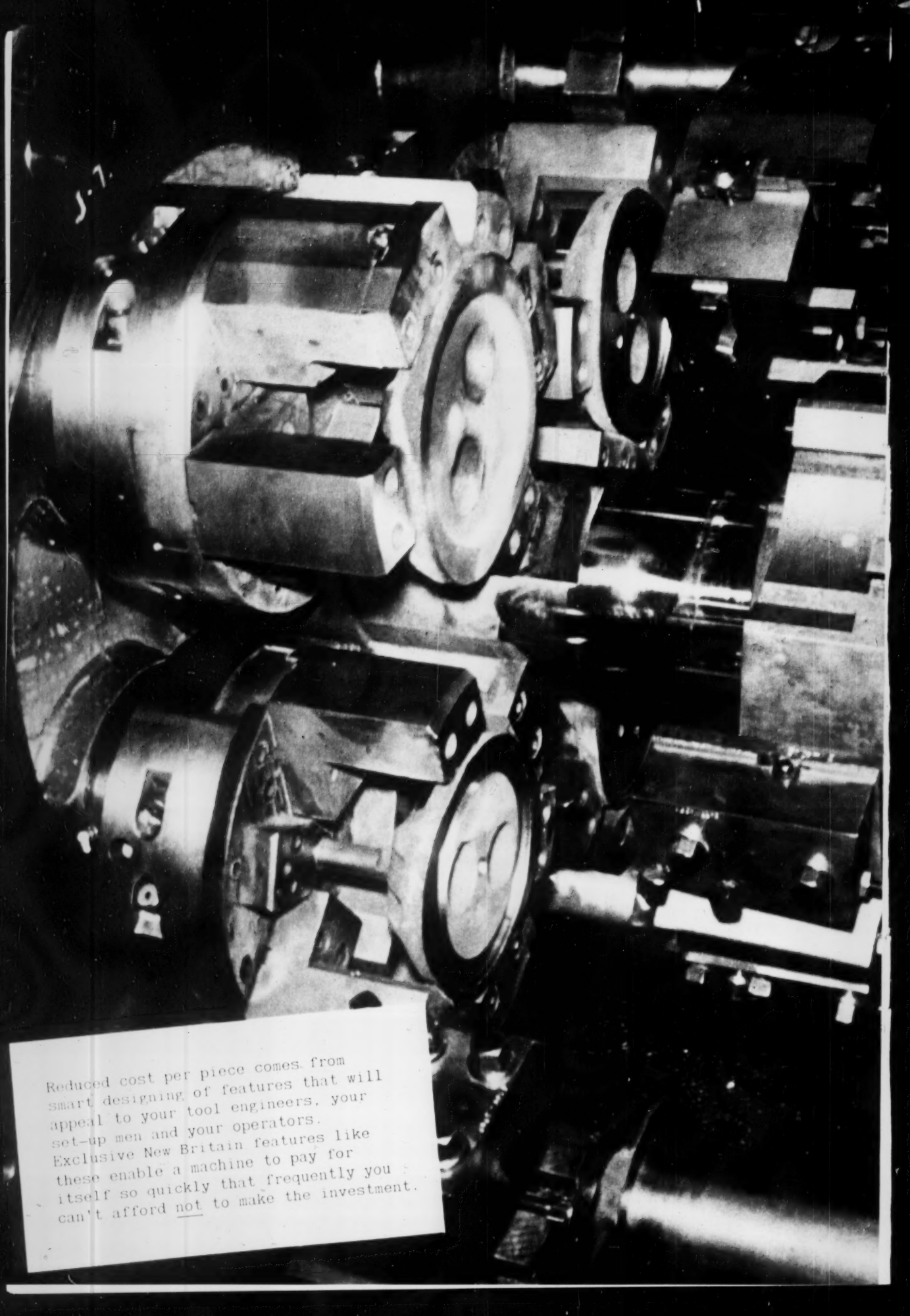
● You get extra-fine performance, day-in and day-out, from Speedomax Recorders or Controllers because they are full of reserves to meet the "unusual" conditions which can and do come up so frequently. And these reserves of course give low maintenance as well as fine performance.

Why not inspect these evidences of quality the next time you need an automatic electronic potentiometer or bridge. See Catalog ND46(1) and (for circuitry) Tech. Pub. ND46(1). Address our nearest branch office, or 1957 Stenton Ave., Philadelphia 44, Pa.

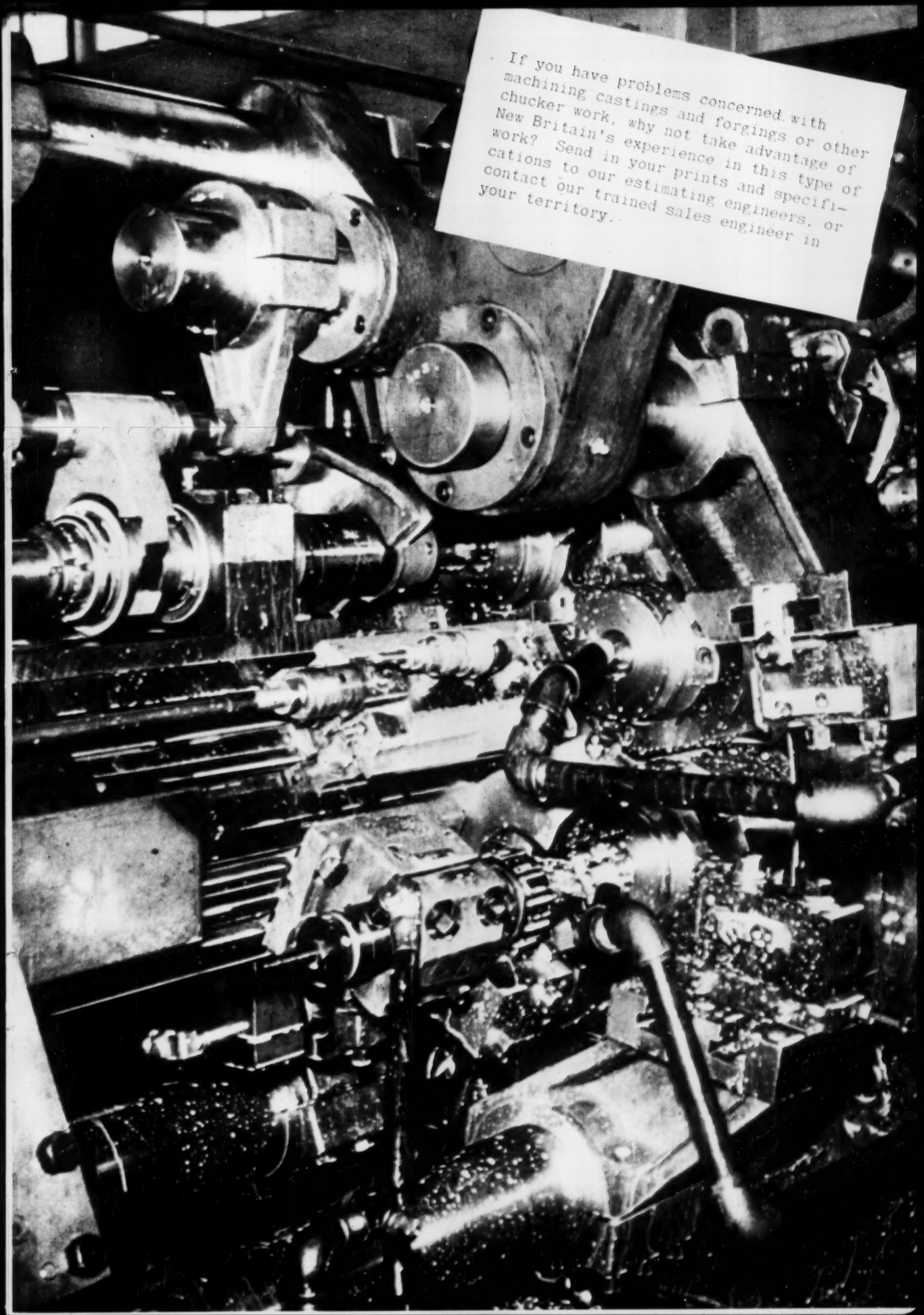
LEEDS NORTHRUP

instruments *automatic controls* • *furnaces*


New Britain's thirty years of experience
in designing and tooling chuckers pays
off for you as competition stiffens...
reduced cost per piece is the best
protection for your profit margins.
THE NEW BRITAIN MACHINE CO.
NB



Reduced cost per piece comes from smart designing of features that will appeal to your tool engineers, your set-up men and your operators. Exclusive New Britain features like these enable a machine to pay for itself so quickly that frequently you can't afford not to make the investment.

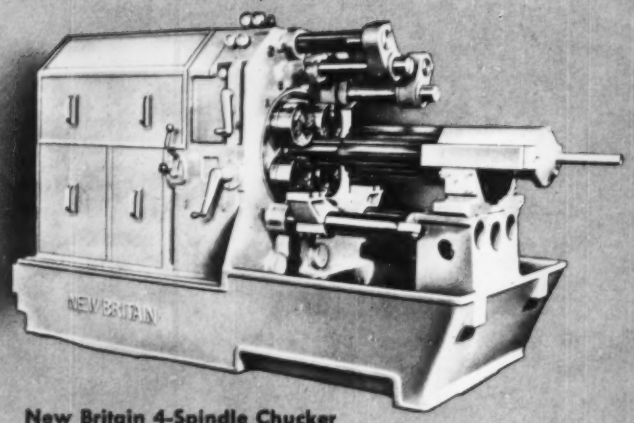


If you have problems concerned with machining castings and forgings or other chucker work, why not take advantage of New Britain's experience in this type of work? Send in your prints and specifications to our estimating engineers, or contact our trained sales engineer in your territory.

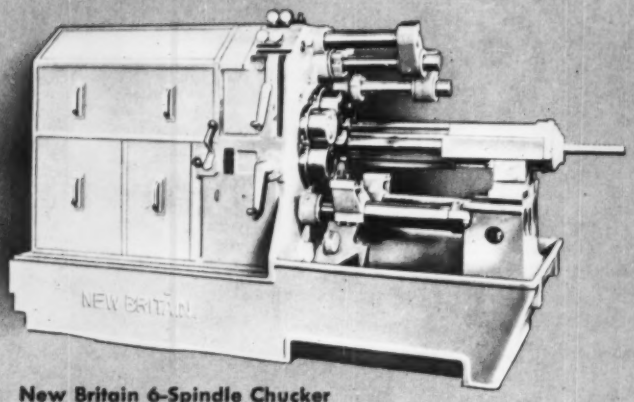
SUSTAINED ACCURACY and PRODUCTIVITY

New Britain open end chuckers feature wide-open accessibility to all tools, and convenient chip removal, with power and rigidity to handle the heaviest cuts. Their high initial accuracy is preserved by such exclusive features as automatic spindle carrier lifting and clamping which prevent wear and weave. Swinging-type forming arms are positionable horizontally and radially without overhang and without exposed surfaces to be affected by grit or chips. They have both radial and longitudinal motion and will handle any length or diameter job within the machine's capacity.

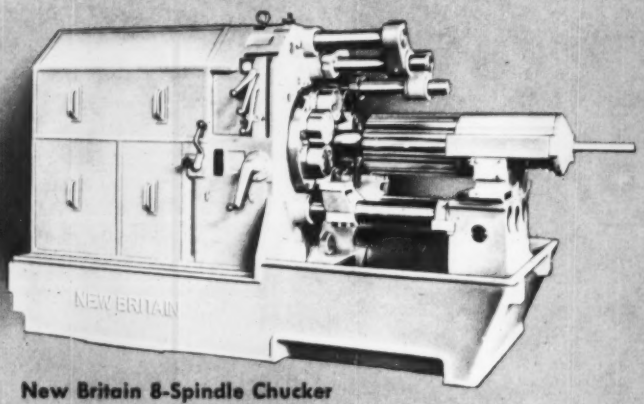
For full information, write us, or consult the New Britain Sales Engineer in your area.



New Britain 4-Spindle Chucker



New Britain 6-Spindle Chucker



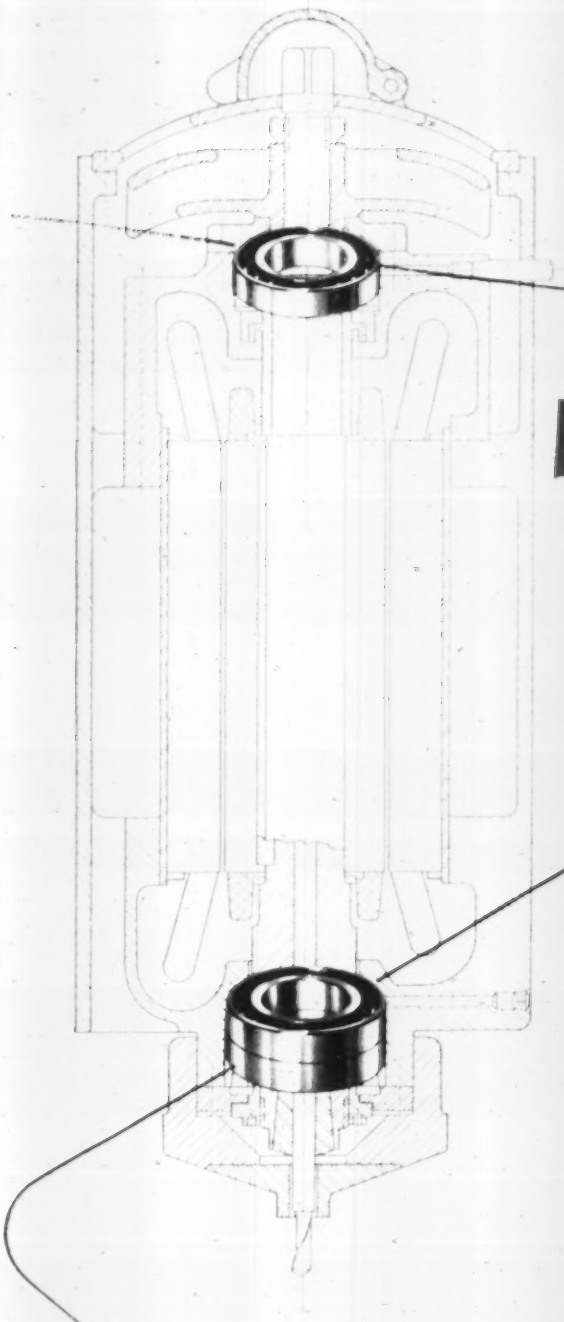
New Britain 8-Spindle Chucker

Our general catalog is filed in the Sweet's Machine Tool Catalog File.

AUTOMATIC BAR and CHUCKING MACHINES • PRECISION BORING MACHINES
LUCAS HORIZONTAL BORING, DRILLING and MILLING MACHINES
NEW BRITAIN +8F+ COPYING LATHES

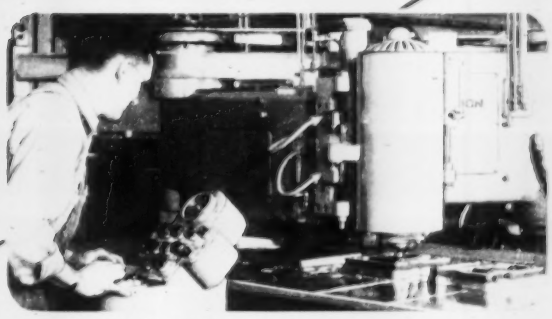
The NEW BRITAIN MACHINE COMPANY

New Britain-Gridley Machine Division, New Britain, Connecticut
Lucas Machine Division, Cleveland 8, Ohio



LOOKS SIMPLE

WAIT TILL YOU HEAR WHAT IT DOES!



High-speed, remote controlled router made by Ekstrom, Carlson & Company, Rockford, Illinois.

You guessed it. This is a blueprint of a spindle head. It shows the arrangement of Fafnir Super-Precision Ball Bearings . . . a single bearing at the top and duplexed bearings at the work end. What's unusual about it? Listen to this . . .

The spindle head is part of an Ekstrom, Carlson high-speed, remote-controlled machine that template routes through 1-inch aluminum plate with a single pass and at cutting speeds as high as 90 inches per minute. It is driven by a 30 h.p. variable speed motor and operates up to 15,000 r.p.m. The radial load on the bearings is as high as 500 to 600 pounds. The spindle head takes tool bits with diameters from 5/16" to 3/4".

Although the top design achievement of this new machine tool is its electrically-controlled hydraulic feed mechanism, the spindle bearing application is no ordinary accomplishment. Fafnir engineers worked hand-in-hand with Ekstrom, Carlson engineers to make it successful. Another example of the Fafnir "attitude and aptitude" . . . a way of looking at bearing problems from the designers' viewpoint, an aptitude for supplying the right bearing to fit the need. The Fafnir Bearing Co., New Britain, Conn.

FAFNIR

BALL BEARINGS

MOST COMPLETE LINE IN AMERICA

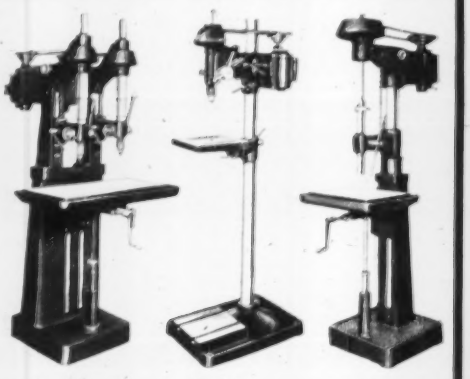
"Buffalo" REDUCES METALWORKING COSTS!

There is a "production-wise" drill, punch, shear, bending roll or wrapping roll in the "Buffalo" line that's bound to speed up your operation. Beside the machines shown here, "Buffalo" builds mill type shears for punching, shearing and blanking; rapid acting punches; riveters; single and double end punches, shears and many others—all easy to operate, all time-savers on setup adjustments, all rigidly and accurately built to stand your heaviest production schedules. Write for bulletins.

BUFFALO FORGE COMPANY

158 Mortimer St. Buffalo, N. Y.

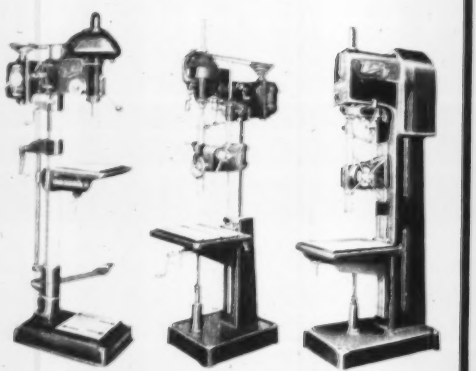
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



No. 14
High Speed
$\frac{3}{8}$" drills
Bulletin 2726

No. 15
$\frac{1}{2}$"
Production Drills
Bulletin 2963

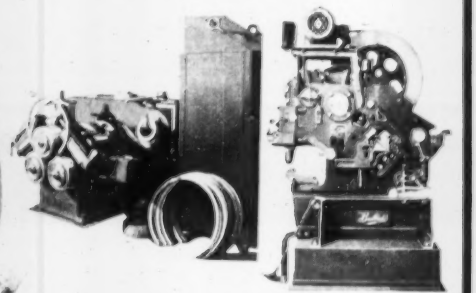
No. 16
Sensitive
$\frac{1}{4}$" Drills
Bulletin 2703



No. 18
1"
Production Drills
Bulletin 3123

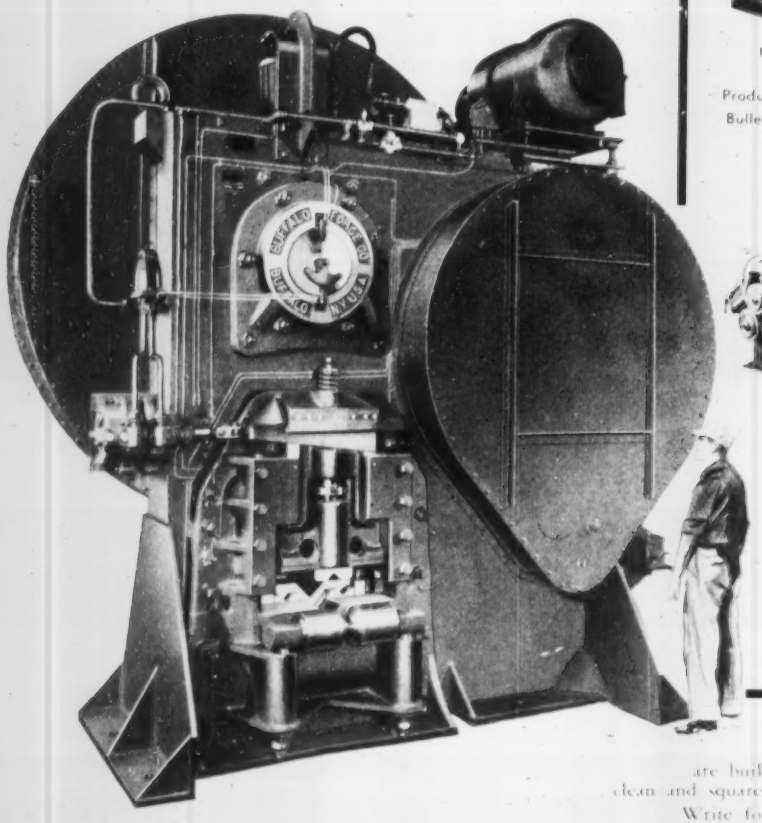
No. 22
Drill up to 2"
holes in cast iron
Bulletin 2989

"RPMster"
the drill with
1001 speeds
Bulletin 3257



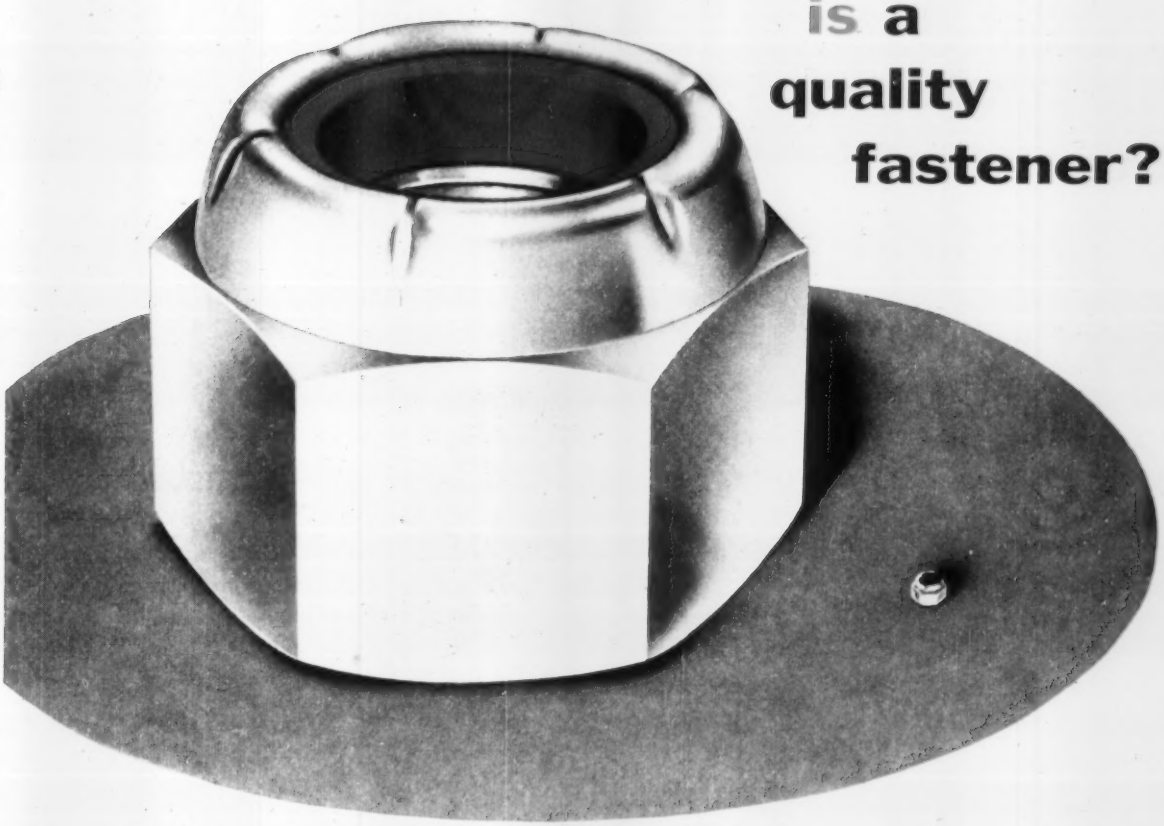
Buffalo Bending Rolls make arcs, spirals, circles from structurals at production speed.
Bulletins 352 B and 3344

Buffalo Universal Iron Workers cut, punch, shear, notch, cape, miter up to 3 operations at once.
Bulletin 360



"Buffalo" Billet Shears are built in 11 sizes to cut up to 10" rounds clean and square at high rates of speed.
Write for Bulletin 8295.

What size is a quality fastener?



Here are two ELASTIC STOP® nuts.
Each has the familiar red locking collar. Each is self-locking, vibration-proof and can be reused many times. Each is a fast, readily assembled one-piece unit . . . will maintain accurate adjustment anywhere on a bolt. Each will afford positive protection against thread corrosion . . . prevent liquid seepage along bolts. Each is manufactured in quantity. Each is exactly controlled as-to quality of raw material, finished dimensions, class of thread fit, seat squareness and finish. Each has a record for precision and uniformly high performance that is unmatched.

But . . . one measures 1-10 inch across the flats; the other, 4 inches. Between these two, there are more than 530 different hex nuts in the ESNA line. They are the result of variations in height, material, finish and size.

Look to ESNA for the top quality self-locking fastener that fits your need best.

ELASTIC STOP NUT CORPORATION OF AMERICA

ESNA

ROLLPIN TRADEMARK

Elastic Stop Nut Corporation of America
Dept. N58-460, 2330 Vauxhall Road, Union, N. J.
Please send the following free fastening information:

☐ ELASTIC STOP nut bulletin ☐ Here is a drawing of our product. What self-locking fastener would you suggest?

Name Title

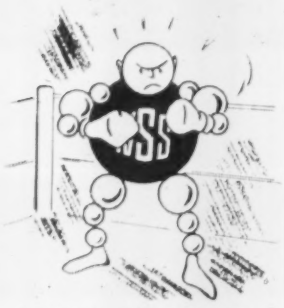
Firm

Street

City Zone State

pioneering developments keep **WHEELABRATOR® STEEL SHOT** *first in abrasives*

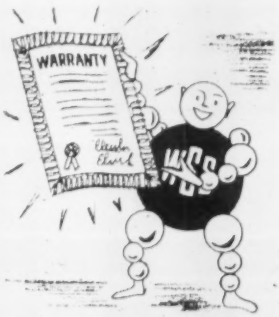
hardness for
FASTER CLEANING



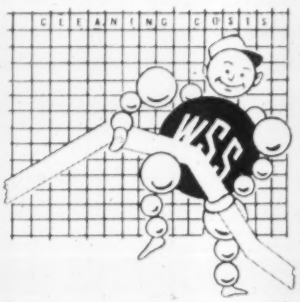
toughness and solidity for
LONGER LIFE

rebound for
GREATER COVERAGE

always round for
LOW MAINTENANCE COSTS



warranted quality for
UNIFORM RESULTS



super performance for
LOWEST OVERALL CLEANING COSTS

ONLY WHEELABRATOR® STEEL SHOT
has all these advantages

These are the reasons why Wheelabrator Steel Shot, made from electric furnace steel, has set a new standard for blast cleaning efficiency. The hardness of this super shot (42 to 50 Rockwell C) concentrates the impact of each pellet on the work so that sand and scale are quickly removed. Its toughness and native impact strength considerably reduces shot consumption. All shot is round and solid—free from surface cracks.

Its unique rebound properties cause it to carom from part to part, penetrating and cleaning intricate cavities not reached by other abrasives. Rebounding on impact, it eliminates the problem of imbedment.

The roundness of Wheelabrator Steel Shot drastically reduces parts replacement and maintenance costs. Because it stays round throughout its life, excessive machine wear due to sharp edges is practically eliminated.

Uniformity of carbon content, hardness, micro-structure and screen analysis, obtained through 19 production control checks, is assured by a written warranty. It gives you the same low-cost, highly effective cleaning performance every day of the week . . . every week of the year.

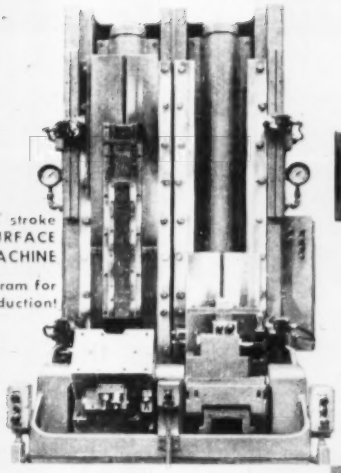
These extra values add up to a SUPER PERFORMANCE that means lower overall cleaning costs for you.

PLUS
50 lb. CARTONS AND PALLETIZING
For Safety, Convenience—And Lower Cost To You
PLUS
A SCHEDULED DELIVERY PLAN
that assures the size and quantity you need
when you need it!

GET THE COMPLETE STORY
Send today for Bulletin 89-A

American
WHEELABRATOR & EQUIPMENT CORP.

509 S. Byrkit St., Mishawaka, Indiana



10 ton, 42" stroke
DRV SURFACE
BROACHING MACHINE

Double ram for
fast production!

with this

RUGGED

LAPOINTE

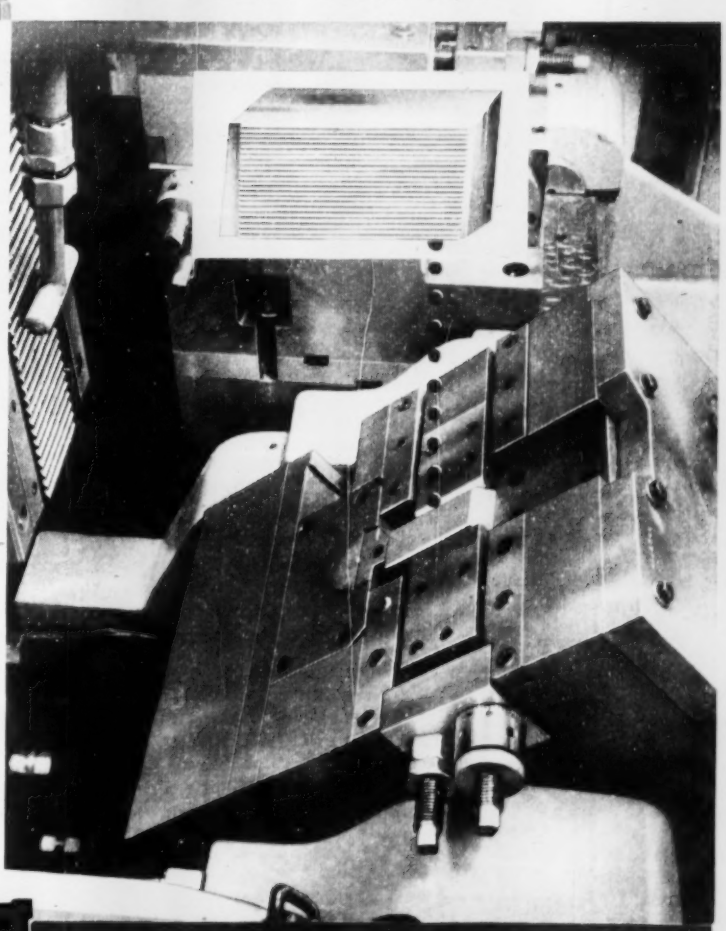
BROACHING MACHINE

and this

RIGID

TIP-DOWN* FIXTURE

Send for Bulletin DRV- 3



you can

BROACH

400

high speed steel

MILLING CUTTER INSERTS

per hour!

...and here's the exciting news: 25 different sizes broached with minimum interchange of adapter blocks.

Exclusive LAPOINTE TIP-DOWN MASTER FIXTURE for safe and convenient handling of parts.

Parts are automatically clamped hydraulically, but manually released for reloading.

*Exclusive with LAPOINTE

THE LAPOINTE MACHINE TOOL COMPANY

HUDSON, MASSACHUSETTS • U. S. A.

Subsidiary Hartford Machine Screw Co.

THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES

We admit it...your business is different

3-Dimension Metallurgical Service

That's why we offer a unique metallurgical service to all manufacturers who have steel problems. We know that steels behave in different ways, in different plants, depending upon what your operations are. We know that the solution, whatever it is, must be tailor-made for your production setup.

Our field metallurgist, the first man on this team, goes right into your plant to find out the facts about your particular problems. He talks to your production men and engineers, makes notes.

Information he gathers is discussed with Republic mill and laboratory metallurgists. All three men then focus their combined knowledge of alloy steels, heat treatment, forging and fabrications on your problem. The recommendation they come up with is based on your costs and your equipment.

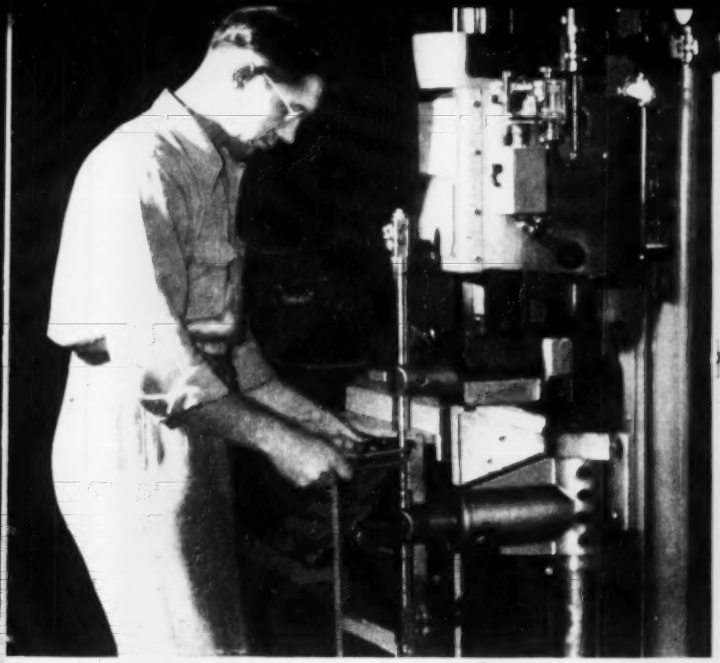
Many manufacturers who have used this Republic 3-D Metallurgical Service have found ways to increase production, make better products, and cut costs. Perhaps you can achieve these same benefits. A call to your nearest Republic office will start the ball rolling.

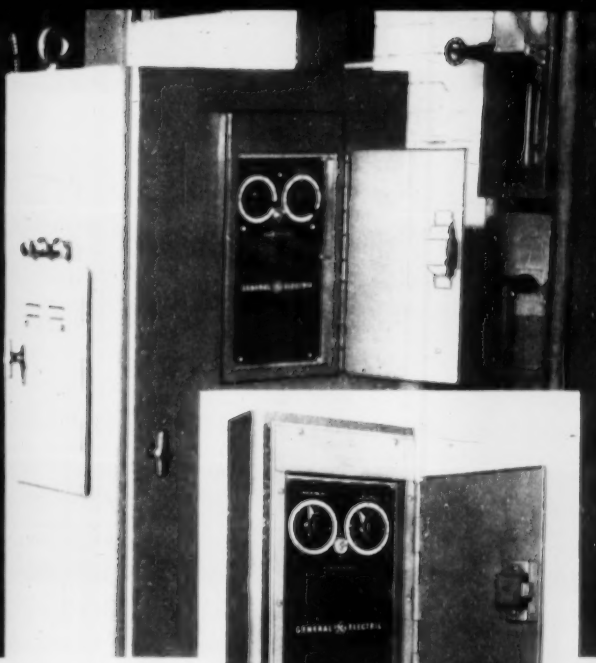
REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

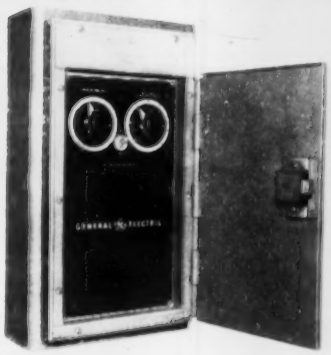
REPUBLIC ALLOY STEELS

REPUBLIC STEEL

Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Bars, Wire, Pig Iron, Steel and Plastic Pipe, Bolts and Nuts, Tubing







NO DETRIMENTAL FLASH, SPATTER, OR EXPULSION in welding aluminum or stainless steel assemblies when you use G-E Slope Control. Shown here applied to a G-E synchronous precision resistance welding control, this accessory overcomes the disadvantages of suddenly applied welding currents . . . gives longer electrode life and reduces tip pickup. Slope time dial is at left, heat control setting at right.

Now, Standard Welding Machines Meet Special Production Requirements

with G-E Accessories for Resistance Welding Controls

Easily added to present equipment or included in your new G-E resistance welding control, these special-purpose G-E accessories now make possible special production performance with standard machines. They can be applied to synchronous or nonsynchronous controls.

Practically any application requirement can be met with G-E controls . . . correcting for current voltage variations, controlling rate at which current rises to welding value, tempering or forging, etc.

For complete information on G-E control and control accessories for resistance welding contact your nearest G-E Apparatus Sales Office or your welding machine manufacturer, or send in coupon at right.

General Electric Company, Section A790-2
Schenectady 5, New York

☐ GEA 6075, Accessories for Resistance Welding Controls

☐ GEA 5945, Synchronous-precision Control

☐ GEA 5916, The Story of Resistance Welding—theory behind the process and complete description of all G-E controls

Name

Company

Address

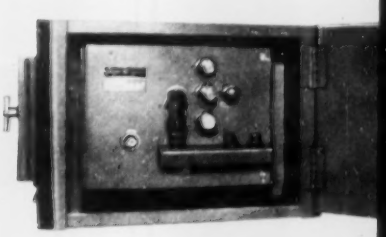
City State

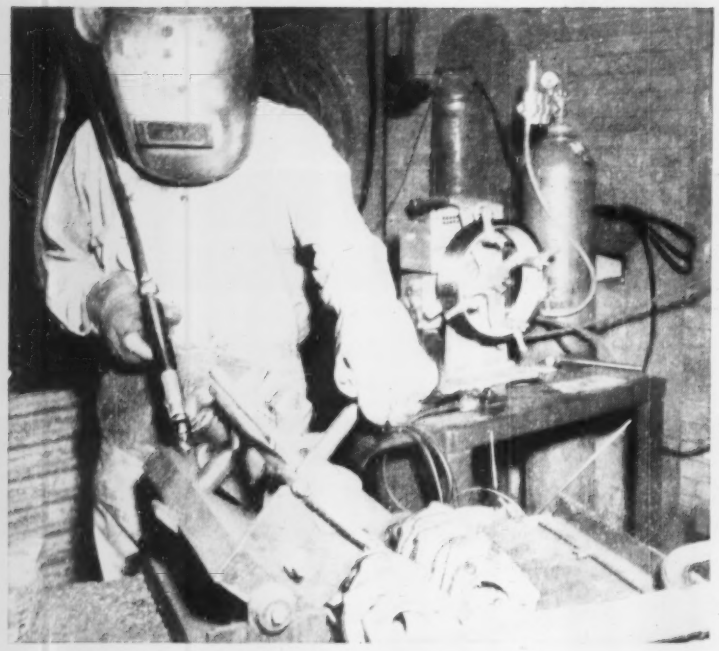
GENERAL ELECTRIC

IMPROVE WELD QUALITY correct incoming voltage variations with G-E Voltage-compensating Regulator . . . maintains rms weld current within ±2%.

REDUCE REJECTS for better, more consistent welds this self-enclosed and completely automatic G-E Current Regulator maintains constant welding current within ±2% of preset value.

REDUCE WELD CRACKING and porosity, eliminate excessive indentation. G-E Up-down Slope Control provides gradual current increase and decrease.





SIGMA WELDING BOOSTS STEEL FABRICATION 100%

A manufacturer of steel truck casters, has doubled his production from 400 to 800 units a day— by changing to sigma welding.

Average welding speed is 120 in. per minute Once clamped, the parts are welded in less than ½ minute.

Used as welded Free from spatter and flux entrapment, the need for finishing is eliminated.

Cut costs Fewer production steps have made possible labor savings up to ⅔ the former costs.

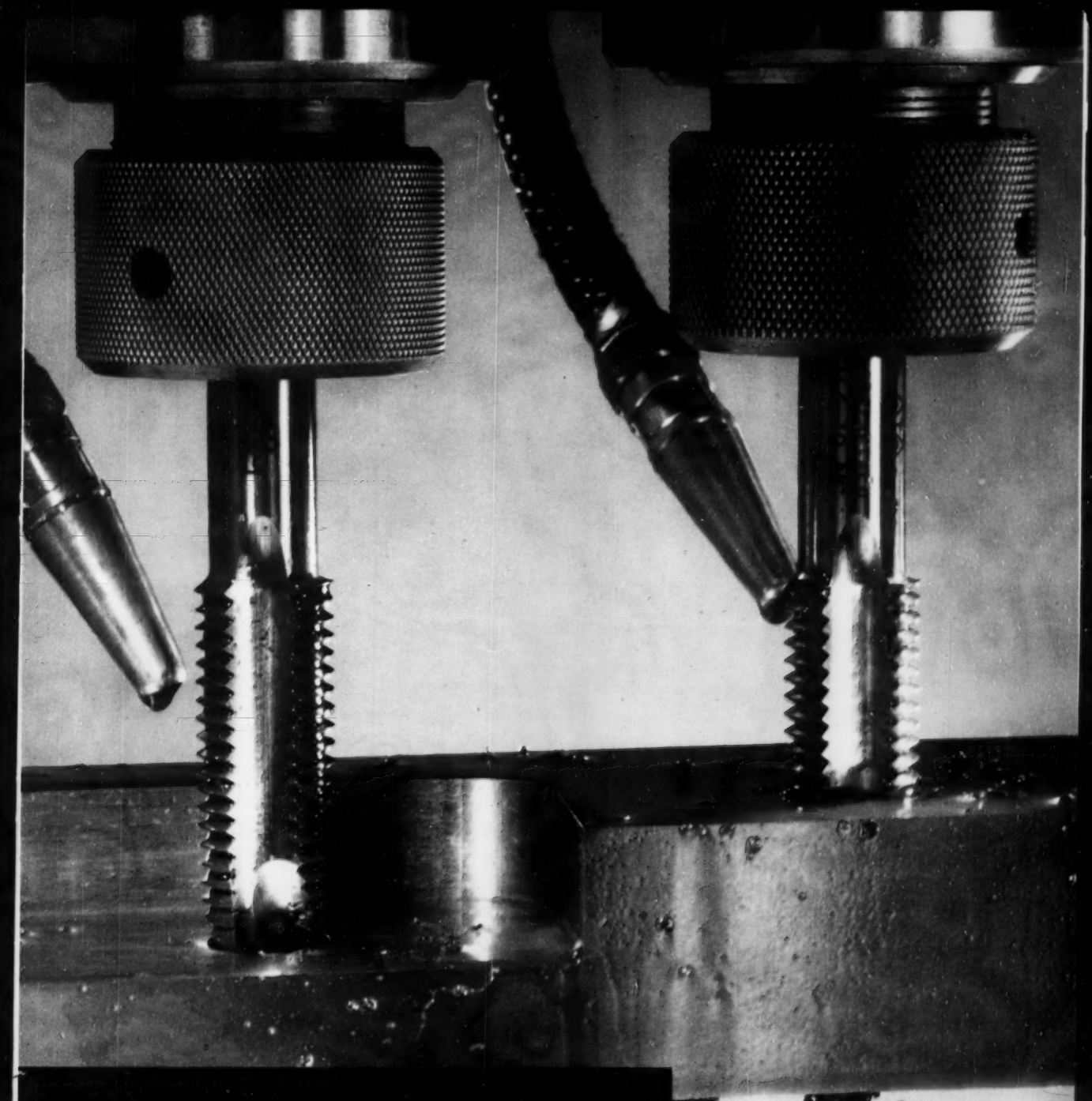
Sigma welding is just one of the welding processes developed by Linde's research and years of experience. Heliarc, sigma, and Unionmelt welding form a top notch fabricating team which is now setting a new peak in industrial production. For small shops or huge production lines, from carbon steel to complex alloys and non-ferrous metals—there is a Linde electric welding process to do the job efficiently and economically. Your local Linde representative will help you determine the best welding process for your job. Call him today for more information.

Visit us at Booths 70-77 Welding Show Memorial Aud. Buffalo May 5-7

Linde
TRADE-MARK

LINDE AIR PRODUCTS COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street New York 17, N. Y.
Offices in Principal Cities
In Canada: DOMINION OXYGEN COMPANY
Division of Union Carbide Canada Limited

"Heliarc," "Unionmelt" and "Linde" are registered trade-marks of Union Carbide and Carbon Corporation.



THE "GUN" TAP, the original spiral pointed tap, was developed by GREENFIELD to lick tap enemy No. 1, breakage due to chips clogging in the flutes. This problem is especially troublesome in "stringy" metals where the chip is long and curling.

The Gun point solves the problem in through holes by causing the chips to shear and "shoot" out ahead of the tap.

In some cases even blind holes can be tapped with the new Bottoming Gun Taps now furnished in machine screw and ¼"-5/16" sizes.

GREENFIELD TAP and DIE CORPORATION

GREENFIELD, MASSACHUSETTS

You?...

a Doubting Thomas?

IF YOU'RE a man who has to be shown, we're right in your corner. Just give Roebling "Blue Center" Steel Wire Rope one try . . . see for yourself how it saves time and costs you less on the job.

Two out of three wire rope users in the industrial field prefer Roebling rope. Call the nearest Roebling office for a Field Man to suggest the best ropes for your purposes.

ROEBLING

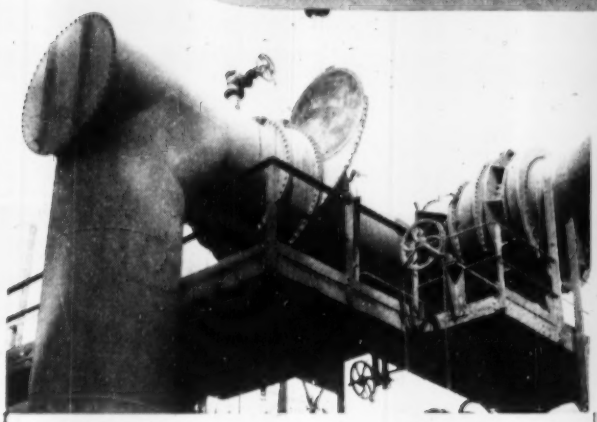
A subsidiary of The Colorado Fuel and Iron Corporation

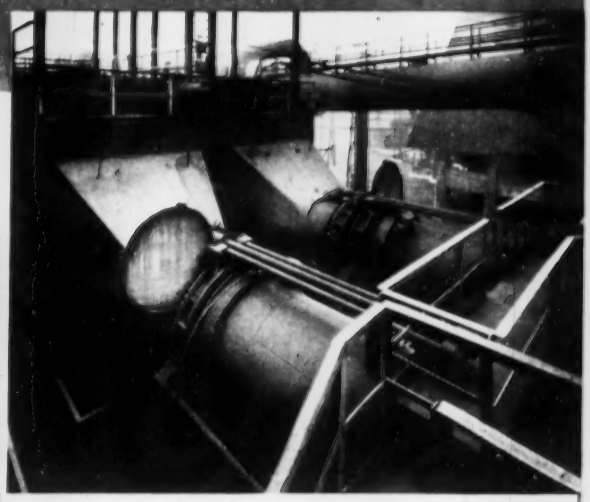
Industrial Gas Mains 6" to 120"

...are best controlled by

Bailey GOGGLE VALVES

PROVED SAFE AND EFFICIENT ON GAS WASHERS, BLAST FURNACE MAINS, PRECIPITATORS, BOILER PLANTS





Mechanical Type

By means of a powerful clamping force applied equally at all points around the disc periphery, the Bailey Mechanical Goggle Valve provides a safe, tight seal for gas mains from 6" to 72" in diameter. The goggle plate is freed instantly by the same powerful mechanism, regardless of the length of time between operations. Both this type and Bailey Thermal Expansion Valves require only a minimum of maintenance.

Thermal Expansion Type

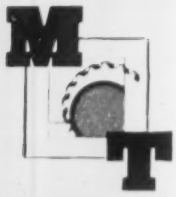
Designed for gas mains from 36" to 120", the Bailey Thermal Expansion type goggle valve operates by the linear expansion and contraction of three sets of steel tubes. When steam is applied, the tubes expand and separate the flanges, thereby freeing the goggle plate for swinging to open or closed position. When steam is removed, normal cooling contracts the tubes, which then clamp the flanges together to form a gas-tight leakproof seal. Can be hand-operated in case of steam failure.

WILLIAM M. Bailey COMPANY

ENGINEERS

LEADERSHIP THROUGH QUALITY

1221 BANKSVILLE ROAD PITTSBURGH 16, PA.



This symbol identifies the National Machine Tool Builders' Association—a group of 196 manufacturers of machine tools. 148 of these companies, or 3 out of 4, are using Garlock KLOZURE Oil Seals.

3 out of 4 Machine Tool Builders use KLOZURE* OIL SEALS

Here are 3 reasons why—

1. The KLOZURE Oil Seal is a precision-made product, so necessary for all components of the tools which are designed for fine precision machining.

2. KLOZURES are *uniform*—both in sealing contact and in spring load.

3. KLOZURE Oil Seals are extremely *efficient*—they provide effective sealing with a minimum of power loss and heat generation.

For positive bearing protection specify KLOZURE Oil Seals for your machinery. KLOZURES are made in many models and a complete range of sizes. Get all the facts—call your Garlock representative or write for KLOZURE Catalog No. 10.

Model 53 finger spring KLOZURE, for normal and high speed service, applied to a shaft to protect the ball bearing.

Model 51—A general purpose finger spring seal for medium speeds.

Model 63—A general purpose finger spring seal for normal and high speed service.

Model 65—A general purpose garter spring seal for normal and high speed service.

THE GARLOCK PACKING COMPANY, PALMYRA, NEW YORK

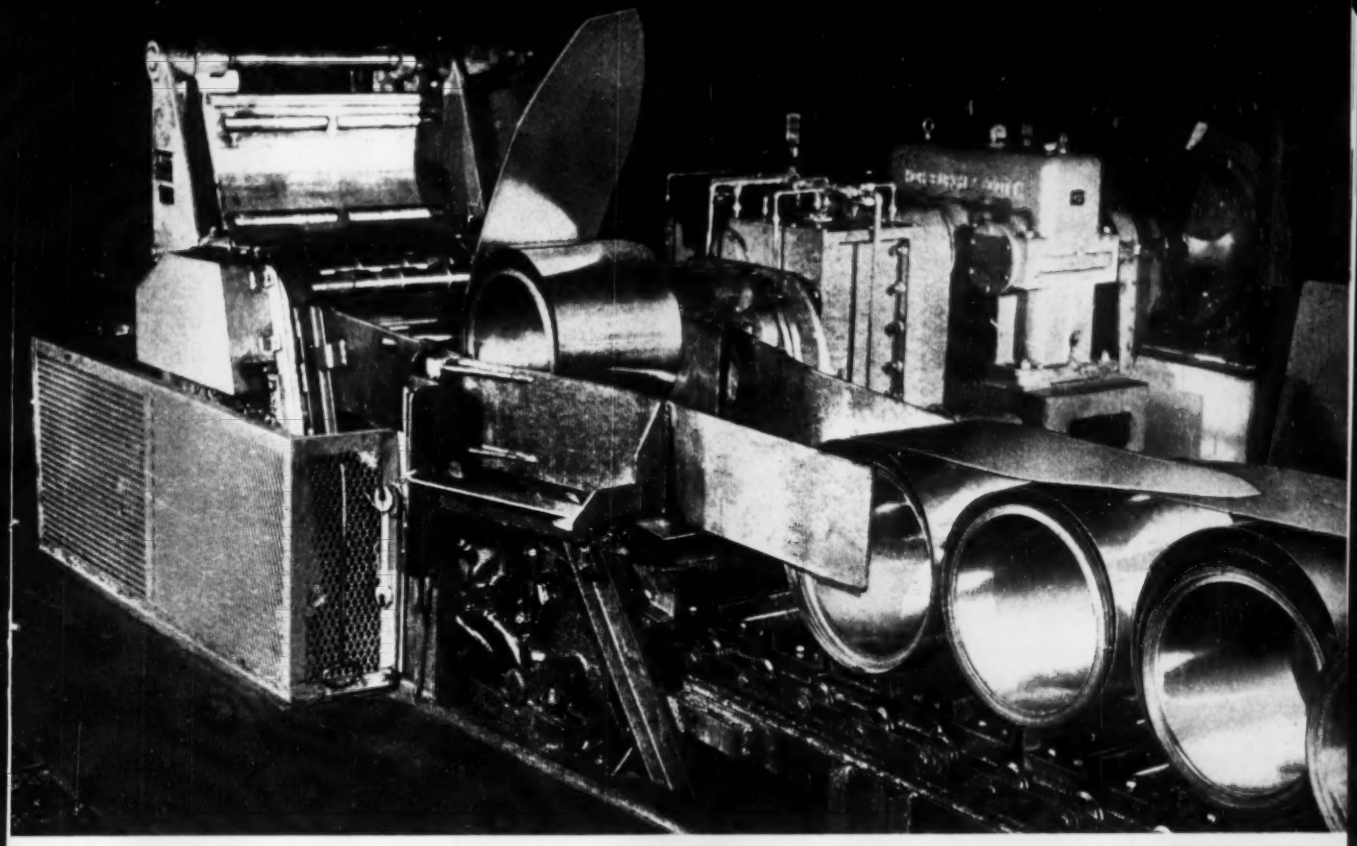
Sales Offices and Warehouses: Baltimore • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Cleveland • Denver • Detroit • Houston • Los Angeles • New Orleans • New York City • Palmyra, N. Y. • Philadelphia • Pittsburgh • Portland (Ore.) • Salt Lake City • San Francisco • St. Louis • Seattle • Spokane • Tulsa.

In Canada: The Garlock Packing Company of Canada Ltd., Toronto, Ont.

*Registered Trademark

GARLOCK

PACKINGS, GASKETS, OIL SEALS, MECHANICAL SEALS, RUBBER EXPANSION JOINTS



New BLISS coiler makes light work of heavy gage brass

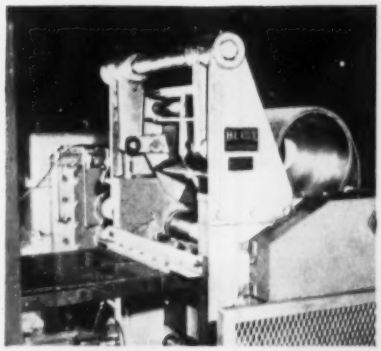
Enables American Brass Company to reduce costs and increase production on certain operations

Ever alert to reduce manufacturing and handling costs, The American Brass Company installed a new Bliss upcoiler in their Waterbury, Connecticut plant. It replaced equipment which could not coil brass or nickel silver alloys heavier than 0.280" gage. This meant that long unwieldy bars—up to 30 feet—had to be carried back to the sticking side of the mill in a costly transfer operation for additional passes to suit the coiler limitations.

With the new Bliss upcoiler, however, 0.400"-gage brass and silver alloys are coiled in widths up to 25 inches. Important savings in machine time and handling costs have been achieved.

The trend to heavier coilers can be observed throughout the metal-producing industry. For example, in addition to the installation at Waterbury, Bliss has supplied American Brass Company with three other duplicate design coilers for its Ansonia, Kenosha and New Toronto plants.

Modern coilers and other material-handling equipment are described and illustrated in Bliss' newly-revised 60-page brochure. Write today for your copy of Catalog 10-A.



THREE-ROLL PYRAMID-TYPE UPCOILER is of rugged, functional construction. Capacity: up to 0.4375" thickness and to widths of 28" on certain mild metals. Straight tailing feature is provided to produce flat "sticking ends" for subsequent passes.

Remember: BLISS SINCE 1857 **for Presses, ROLLING MILLS, Special Machinery**

E. W. Bliss Company • General Office: Canton, Ohio

ROLLING MILL DIVISION: SALEM, OHIO

Subsidiary: The Die Supply Company, Cleveland, O. • E. W. Bliss (England) Ltd. • E. W. Bliss Company (Paris) France

U. S. Plants in Canton, Salem and Toledo, Ohio; Hastings, Michigan; and San Jose, Calif. *Branch Offices* in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo; and Toronto, Canada. *West Coast Representatives:* Moore Machinery Co., Los Angeles and San Francisco; Star Machinery Company, Seattle. *Other representatives throughout the world.*

Can you cut expenses without cutting corners?

You can, but only by knowing continuously *where* your money is being spent and *why*. To keep giving you this kind of information before it becomes history takes a versatile accounting method backed up by versatile equipment.

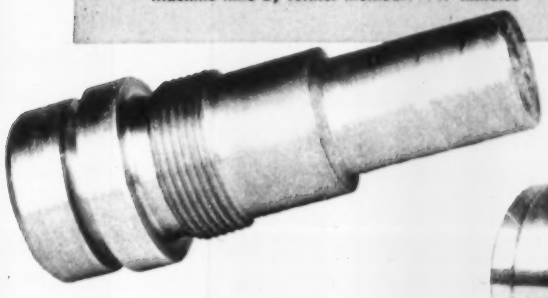
In addition to all the *control* data you need, IBM accounting provides you with all the records necessary to each of the major areas of accounting. This means that your regular accounting data can be broken down in any way to give you the best means of appraising various phases of your business. You get a complete business picture—showing where you can cut expenses wisely to increase current profits and keep your company in "fighting trim."

IBM accounting machines do the complete job—often providing important savings in time, overhead, and money. For details, call the local IBM office today.

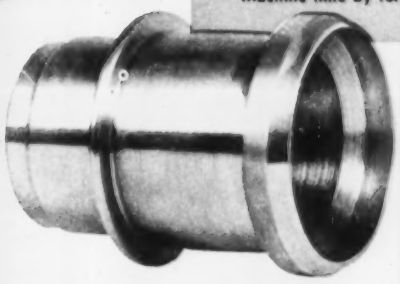
IBM

International Business Machines, 590 Madison Avenue, New York 22, N.Y.

JOB FACTS:
Part: . . . . . Pilot Stud—1⅝ x 6" long
Material: . . . . . A-4615 CR Steel
Machine time on Model M: . . . . . 7½ minutes
Machine time by former method: . . 17 minutes



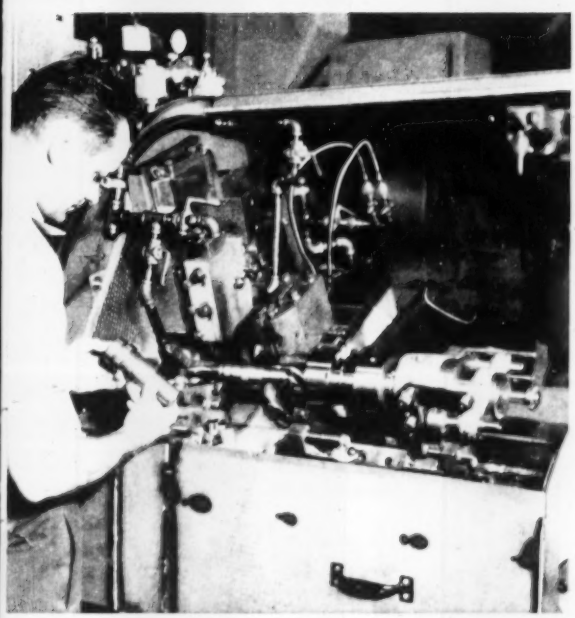
JOB FACTS:
Part: . . . . . Whirl—3½ x 4⅝" long
Material: . . . . . Leaded Open Hearth Steel
Machine time on Model M: . . . . . 3¾ minutes
Machine time by former method: . . 21 minutes



here's why it takes

more than just speed

to keep production on schedule

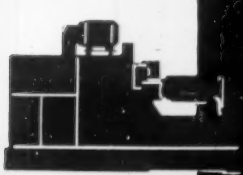


It's one thing to be able to machine a steel part at the fastest practical speeds and feeds. But speed without dependable control is wasted. You get both speed and control with MODEL M SINGLE SPINDLE AUTOMATICS.

Take the parts shown. In both cases, the completed pieces are machined automatically at their same predetermined rate every time, without interruption. In the long stud there are 11 operations including threading—the piece is completed on the Model M in less than half the time of the former method. In the other piece (with a large hole partway and a small one the rest of the way) spindle speeds are changed automatically during the cycle to provide the best speeds and feeds for different diameter cuts—and the time for a finished piece is less than ½ that of the former method.

Why not get all the facts? Write for Catalog M-50A. Or, better still, ask our engineers to talk with yours about your production jobs—long or short run.

Nothing can so completely destroy profits as the continued use of obsolete equipment.



The NATIONAL ACME COMPANY

170 EAST 131st STREET • CLEVELAND 8, OHIO

ACME-GRIDLEY BAR and CHUCKING AUTOMATICS
1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • Limit, Motor Starter and Control Station Switches • Solenoids • Contract Manufacturing.

For Intermittent Service
You Can't Beat this Welder

You Can't Beat its Price

You Can't Beat
its Performance

New P&H TI-295 295-amp AC Welder

...the only low-cost intermittent-type welder that can handle low-hydrogen and stainless-steel electrodes

Here's a low-cost, low-input welder — with a rated load and duty cycle as follows: 295 amps, 20%; 250 amps, 30%; 200 amps, 50%.

Wide Range — You can go from 25 amps to 300 amps. You can use this machine on light gauge material, as well as on heavy plate.

No Arc Booster — Just think — you get an open-circuit voltage of 75 volts. This means — you can weld with low-hydrogen or stainless-steel electrodes. No other welder that sells for the low price of the TI-295 can do this. Arc-striking is easier and electrode-sticking eliminated.

Exclusive P&H Dial-lectric Control — You get sound, uniform welds because all you have to do is turn a radio-like knob to get exactly the heat you need. The amperage adjustment is creep-proof too — you set the heat and it stays. Changing heat is only a matter of a second or two — a three-quarter turn of the knob is all that's required to go from minimum to maximum capacity.

No hard-to-work crank to turn. No moving parts — no moving coils or cores, no worm gears or sprockets, chain or lever adjustments. This means there's less wear, less maintenance, *less noise* — nothing to bind or "freeze" from rust.

Contact your P&H representative or distributor — see how easily the new P&H TI-295 outperforms other welders in this class.

P&H WELDING DIVISION
HARNISCHFEGER CORPORATION
4411 W. National Ave., Milwaukee 46, Wis.
2599

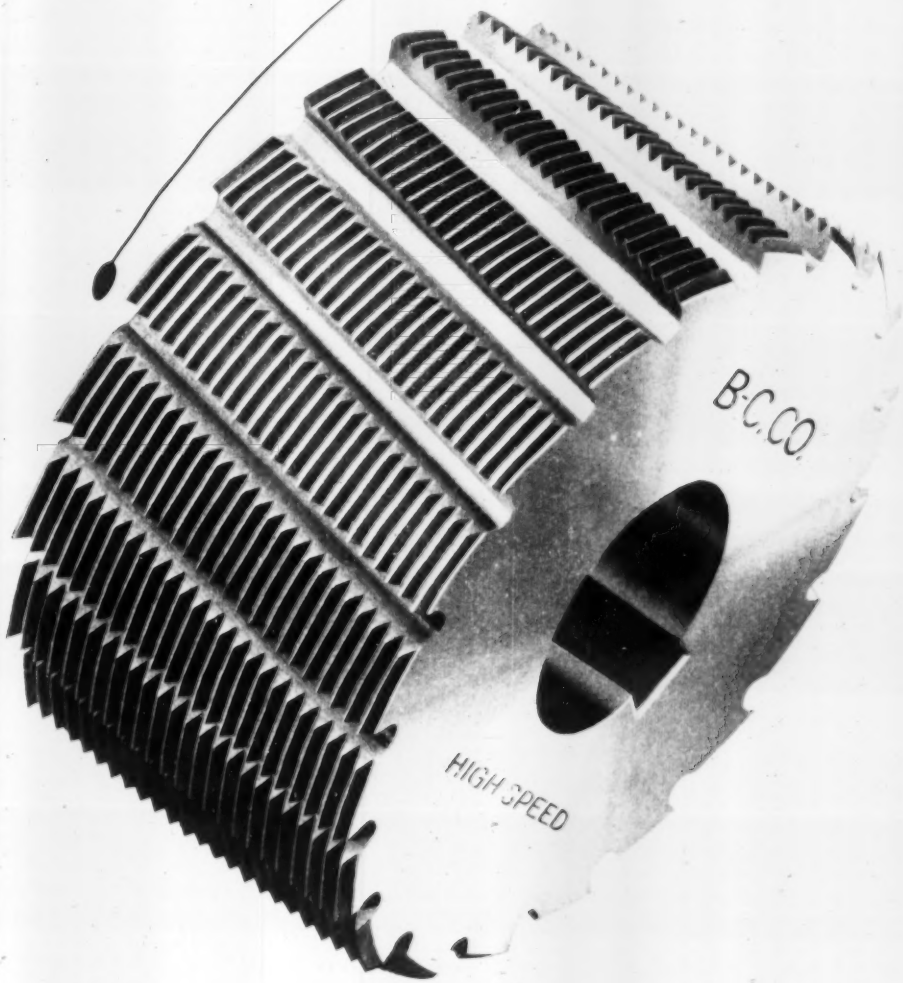
the P&H *Line*

P&H Welding equipment is manufactured and sold in Canada by
REGENT EQUIPMENT MANUFACTURING COMPANY LTD. • 455 King Street West • Toronto, Ontario, Canada

Barber-Colman

THREAD MILLS

custom-built for high production, long cutting life, accurate threads



Thread accuracy and economical cutting life are synonomous with Barber-Colman Thread Mills because cutters which mill smoothly and easily, without premature dulling, also cut threads more accurately.

Barber-Colman cutter engineers have developed new manufacturing techniques for producing precision thread milling cutters with unground teeth, straight or helical flutes in either shell or shank styles, which give unusual tool life. The finest ground thread mills are also available from coarse to very fine pitches.

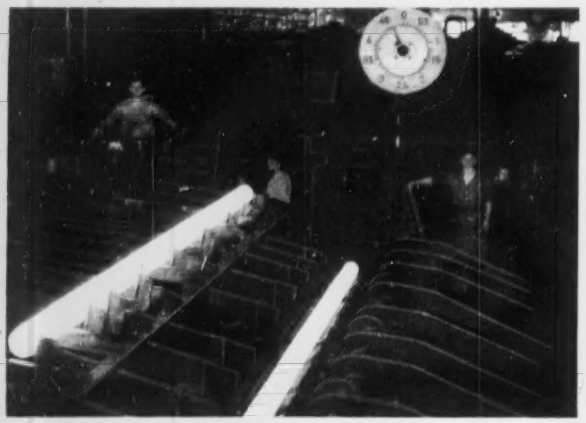
For special help in thread milling problems consult your Barber-Colman representative. He is a specialist on accuracy and milling of threads.

BARBER COLMAN

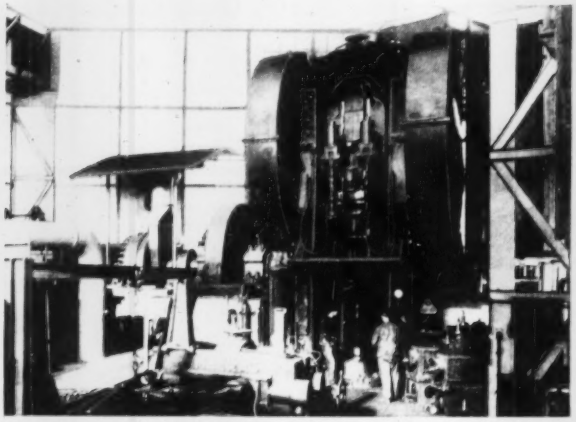
Barber-Colman Company

GENERAL OFFICES AND PLANT, 804 ROCK STREET, ROCKFORD, ILLINOIS

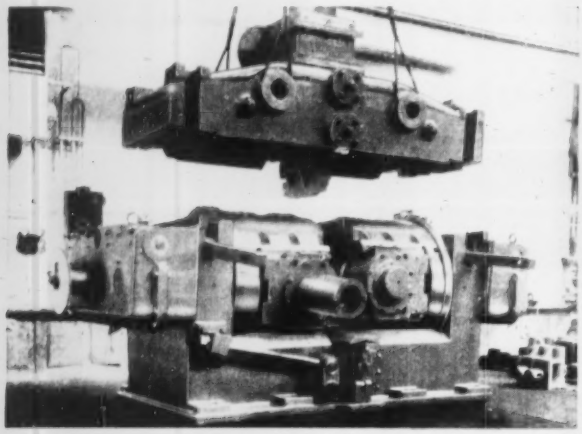
New mill machinery speeds seamless tube production



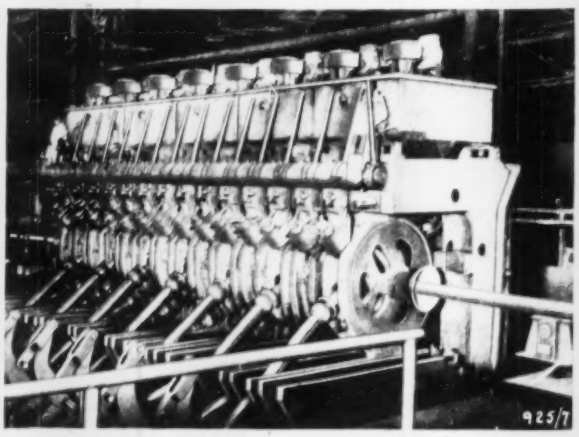
HIGH OPERATING SPEED of Mannesmann-Meer automatic return mill boosts production, cuts costs in any automatic mill plant. Special guides in mandrel bed aid quick changeover of schedules.



180 STEEL TUBES PER HOUR — that's the production record of this mechanical extrusion press. We also offer high-speed hydraulic extrusion presses for the non-ferrous industries.



HEAVY-DUTY REELER WITH ROLL OBLIQUITY adjustable in both planes, has individual motor drive for each roll. Permits use of a plug of any taper for any desired expanding action. All Mannesmann-Meer reelers are extra heavy and rugged in construction with anti-friction bearings throughout to assure best possible rolling conditions.



INCREASE OD REDUCTION at each three-roll stand on this stretch-reducing mill. New low-cost group drive permits speed adjustment for each stand. Special stand changing device provides for quick schedule change. These same features are available for continuous mandrel mills. Many outstanding design features are also available for both sinking and sizing mills.

Got production bottlenecks on seamless tubes?

At Mannesmann-Meer you'll find complete mills or mill machinery designed and built specifically to speed production and cut costs.

We're the *only* manufacturer of tube mill machinery who can draw on over 65 years of experience in the *operation* as well as the design of complete seamless mills. Let us put this production and engineering know-how to work for you.

Examples of some of our new developments in mill machinery are shown here. Mechanical and hydraulic extrusion presses — piercing mills — automatic return (plug) mills — continuous mandrel mills — heavy-duty reelers — assel mills — pilger mills — expanding mills — sizing mills — stretch-reducing mills — large electric weld pipe mills — rotary straighteners — tube reducing machines — are but a few of the many products in our complete line.

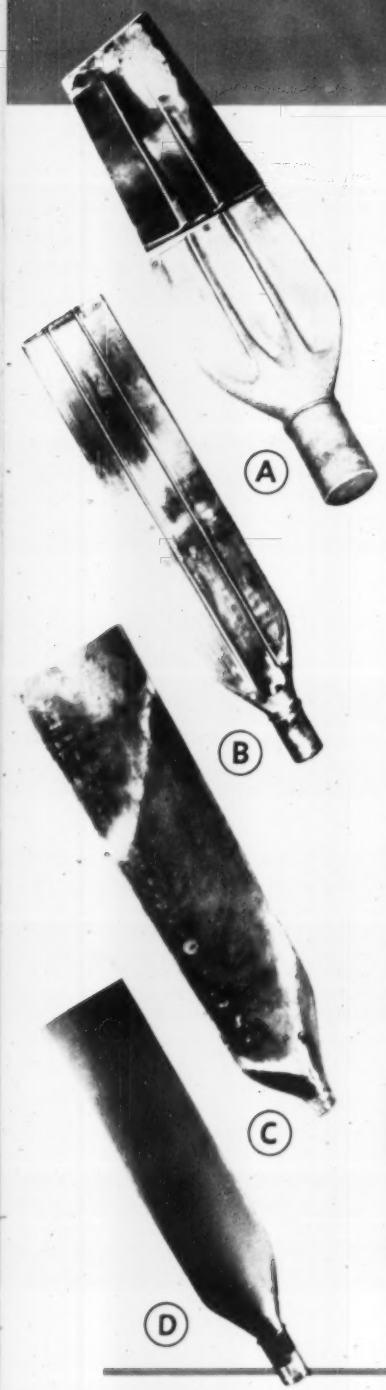
MANNESMANN-MEER

ENGINEERING & CONSTRUCTION COMPANY

900 Line Street, Easton, Penna.

WORLD SPECIALISTS IN HIGH-SPEED TUBE-MILL MACHINERY

New facts for your file on USS CARILLOY STEELS



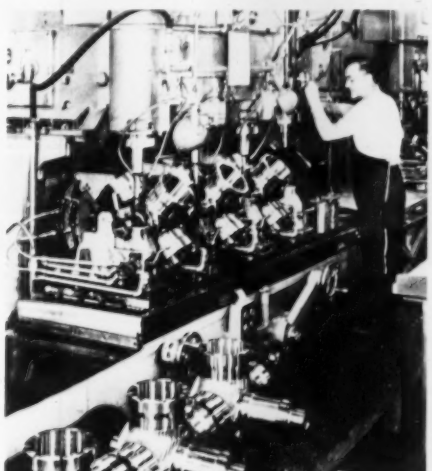
USS Carilloy steel passes rigid tests for propeller blades

● An important manufacturer of propellers for military aircraft has found that in stringent magnaflux tests, USS CARILLOY steel performs completely satisfactorily.

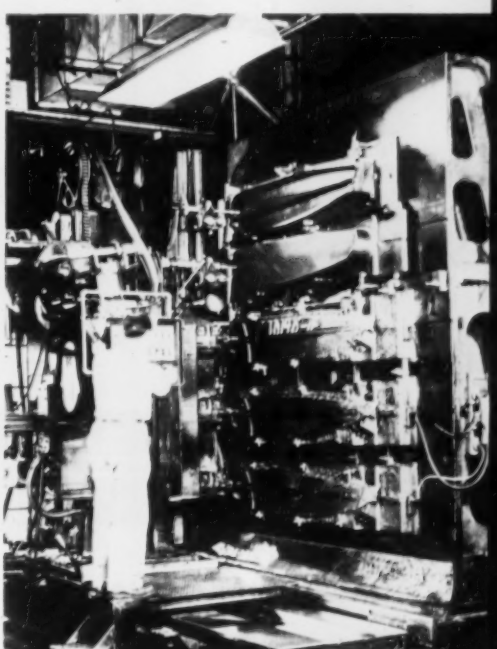
The high stresses in propeller blades and hubs naturally require extremely high quality steels. Accordingly, the U.S. Army and U.S. Navy have set up rigid quality specifications requiring that every heavily stressed part must be magnafluxed several times during its production.

With USS CARILLOY 4340 electric furnace aircraft quality steel, this important manufacturer is able to count on the performance required for this severe application. The consistent high quality of USS CARILLOY aircraft steel has meant greater savings to this customer through minimum magnaflux rejections of costly fabricated parts.

USS CARILLOY steels have established an enviable record for meeting the highest quality requirements. Therefore, when you need a standard AISI analysis or a special steel for an unusual application, it pays to call in a USS Service Metallurgist. He can help you solve any steel problem.



THESE HIGH QUALITY aircraft propeller hubs are forged and machined from semifinished CARILLOY 4340. They meet extremely-tough magnaflux requirements.



AFTER FORGING AND MILLING, 750-lb. thrust sections are hogged out on this Kellering machine. Finished sections weigh about 155 lbs. USS CARILLOY steel maintains a No. 1 quality position on these heavy-duty parts.

FOR BIG PROPELLERS, 2 forged sections (**a**) are welded together to form one blade thrust member. Pieces are then ground and magnafluxed, Kellered, ground, and magnafluxed again (**b**). Mill camber sheets (**c**) then are copper brazed to the thrust members. Entire unit is heat treated and polished before final magnaflux test and cadmium plating. Rigorous magnaflux testing assures that every finished blade (**d**) can withstand the tremendous stresses encountered on the latest high-speed planes.

USS

UNITED STATES STEEL CORPORATION, PITTSBURGH · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

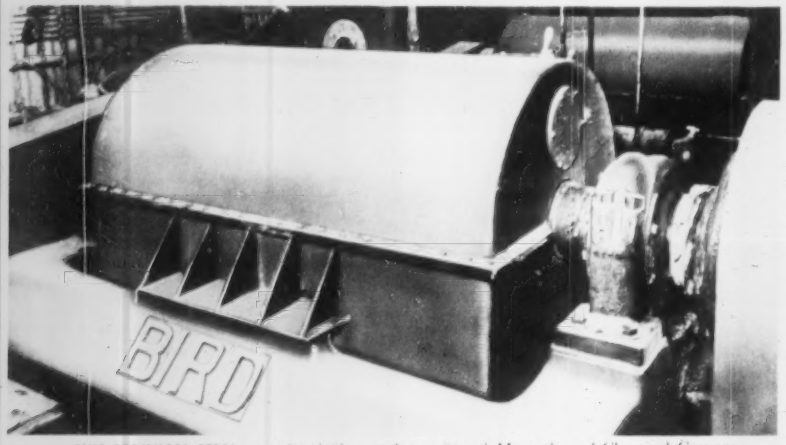
UNITED STATES STEEL

New facts for your file on

USS STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

Solids removed from potash brine in centrifugals of Stainless Steel



THIS STAINLESS STEEL centrifugal filter at International Minerals and Chemical Corporation, Carlsbad, N. M., handles 10 tons of 60% muriate crystals per hour. It was manufactured by Bird Machine Company, South Walpole, Mass.

● Processing potash from the salt beds near Carlsbad, N. M., puts centrifugal filters to a severe test. That's why much of this equipment is made of Stainless Steel.

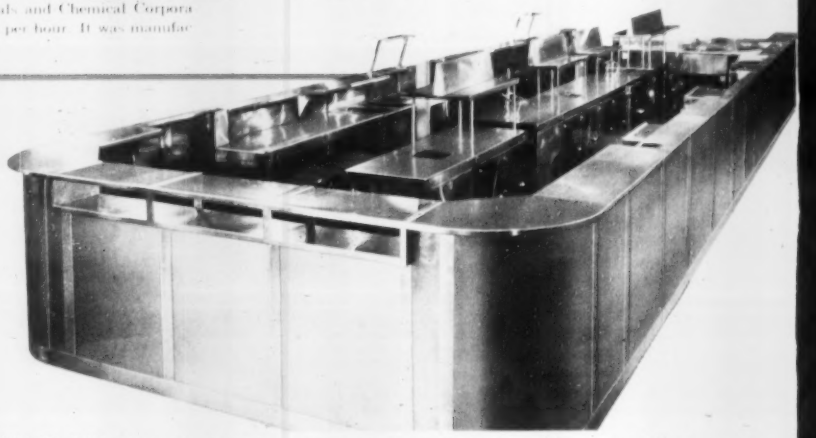
The potash brine is highly corrosive and the solids to be recovered are very abrasive. As a result, Bird Machine Company, South Walpole, Mass.—which supplies many of the centrifugals for this type of application—uses Stainless Steel for rotating parts and other parts of the filters that come in contact with the material.

Filters built of Stainless have handled many thousands of tons of these materials—separating and dewatering the crystalline solids—with high efficiency and overall economy.

Lake steamer cafeteria is fabricated from Stainless Steel

The attractive appearance, excellent sanitary qualities and long life of Stainless Steel have gained a wide range of food handling jobs for this durable material.

N. Wasserstrom and Sons, Incorporated, Columbus, Ohio, in fabricating cafeteria equipment for a Great Lakes steamer, used Stainless Steel very extensively. The result is an installation that looks well, cleans easily and lasts almost indefinitely.



STAINLESS STEEL was used extensively in this cafeteria installation for a lake steamer. The installation was fabricated by N. Wasserstrom and Sons, Incorporated, Columbus, Ohio.

MANUFACTURED FROM USS STAINLESS STEEL UNITED STATES STEEL

Now is the time to use the sales appeal of Stainless Steel

The many benefits of Stainless Steel make its use in your product a real "plus" from a sales standpoint. Its lasting good looks alone will often justify its use. And, along with this important advantage, goes exceptional resistance to corrosion and abrasion, ease of cleaning and low maintenance costs.

There's never been a better time to take advantage of the qualities of Stainless Steel. And when you do, be sure that perfected, service-tested USS Stainless Steel is used.

UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

USS

New facts for your file on USS HIGH STRENGTH STEELS

1933 USS HIGH STRENGTH STEELS 1953
TWENTY YEARS OF PERFORMANCE

USS COR-TEN steel gives heavy-duty earth moving equipment the stamina to stay on the job

• By building maximum strength and durability into parts ordinarily prone to failure, Allis-Chalmers, through the use of USS Cor-Ten steel, has ensured a high degree of productivity and profitable performance for their TW-300 Motor Wagon.

Used in the sides, ends and bottoms of the bowl of this big capacity hydraulically operated bottom dump wagon, Cor-Ten steel increases strength 50% over carbon steel construction, provides 50% higher fatigue strength, materially increases resistance to abrasion and to sudden blows in loading. An added advantage is increased resistance to atmospheric corrosion 4 to 6 times that of carbon steel.

As a result, breakdowns and time-out for repairs are reduced to a minimum, as are maintenance and replacement costs.

In mass-produced truck body members, USS COR-TEN steel saves weight, adds strength, facilitates accurate construction

By mass-producing standardized truck body shapes and sections that can be readily and quickly assembled, Parish Pressed Steel Company, Reading, Pa., has made it possible for local body builders to turn out steel truck bodies to meet individual truck owners' requirements at high speeds and low cost.

The use of USS Cor-Ten high strength steel in these prefabricated body sections not only permits light, strong and very durable construction, but because of the high physical properties of this steel and its consistent uniformity, it is possible to hold designs to exact limits and very close tolerances. Over all results are much better than when less efficient materials are used.

With USS Cor-Ten steel construction like this, the body builder benefits because his operations are speeded up and his assembly costs are reduced. The truck owner benefits because he gets a truck that, while light in weight, has maximum strength and durability, is readily repaired if damaged and requires minimum maintenance.

New catalog gives complete story of USS COR-TEN steel

Here are 58 pages of factual data that show the substantial economies that can be affected in equipment and structures by using USS Cor-Ten steel to reduce weight or to increase durability and service life. This book is just off the press. Crammed with information, it should be in the reference files of every designer. It fully describes the properties and characteristics of USS Cor-Ten steel. Its many illustrations show the wide variety of applications in which this superior high-strength steel has been used to reduce operating costs and to keep maintenance costs at a minimum. Send for your copy.

UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

USS

Borg-Warner speeds staking job 36%

with a 75-ton MULTIPRESS®

Safer operation, fewer rejects and other production gains reported at Mechanics Universal Joint Division, Rockford, Illinois

IN this operation, a flat steel disc 3/32" thick is inserted by hand in a steel sleeve used in an automotive universal joint. The disc rests on a shoulder formed where the inside diameter of the sleeve changes abruptly to a smaller dimension.

The sleeve is internally machined, leaving a small, continuous lip of metal just above the edges of the correctly seated disc. With gentle, smooth staking effort, the Multipress ram tooling forces this lip solidly against the edges of the disc. It is a precision operation, as the disc must separate the two different I.D. areas with a permanent oil-tight seal.

The 75 ton Multipress, equipped with a six-station Denison Index Table, is set for continuous cycling. The ram reverses automatically when preset pressure is reached.

The operator simply places the parts in the table fixtures, with the discs properly in place. The parts are then indexed automatically under the ram, and the oil seal is firmly staked in place. At the second index position past the ram, the operator removes the staked assemblies.

In addition to a 36 per cent production gain, Multipress does the job with closer uniformity. Scrap has been reduced to the vanishing point, die life increased, and labor costs cut. The same Multipress brings similar savings on 21 different operations at this plant.

In the thick walled steel sleeve both outside and inside diameters are larger at one end. A disc-shaped oil seal separates the different sized areas.

The sleeves, with oil seal discs in place, are simply placed in fixtures at each of six Index Table stations, permitting continuous loading and unloading.

DENISON Hydr OIL ics

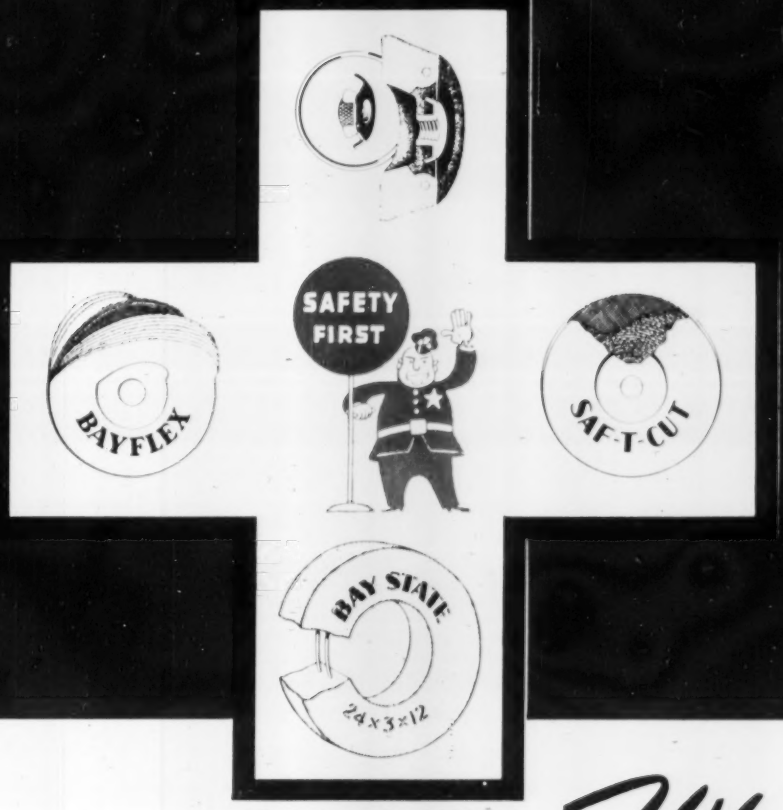
PUMPS | MOTORS | CONTROLS | PRESSES

Multipress offers a wide range of bench and floor models, in capacities from one-ton to 75 tons. Manual, footpedal, push-button and automatic controls are available, for single or sequence operations. Dual safety controls and the servo-type Multipress Touch Control are also available. Six-station and 12-station Indexing Tables and many other standard Multipress attachments provide many additional production-speeding advantages. Write for the illustrated story, "MULTIPRESS — and how YOU can use it" . . . there's no obligation.

Be Sure to See Denison Booth #1400 at ASTE SHOW

THE DENISON ENGINEERING COMPANY, 1163 Dublin Rd., COLUMBUS 16, OHIO

Bay State Grinding Wheels



. . . are SAFE Wheels

Constantly higher grinding wheel safety factors have developed from BAY STATE'S 32 years of grinding wheel progress.

Pioneers in the field of scientific grinding wheel reinforcement, BAY STATE research found the secrets of adding functional strength to the natural sharpness of abrasive products.

To rigid wheels, for example, BAY STATE adds the tensile strength of steel, imbedded or tension-wound as safety demands. To wheels that must flex and "give" to do their work, BAY STATE builds in the resilient ruggedness of carefully selected sinewy fibers.

Results: Efficient SAFE wheels for *all* your grinding operations from BAY STATE . . . a foremost supplier of abrasive products to American industry.

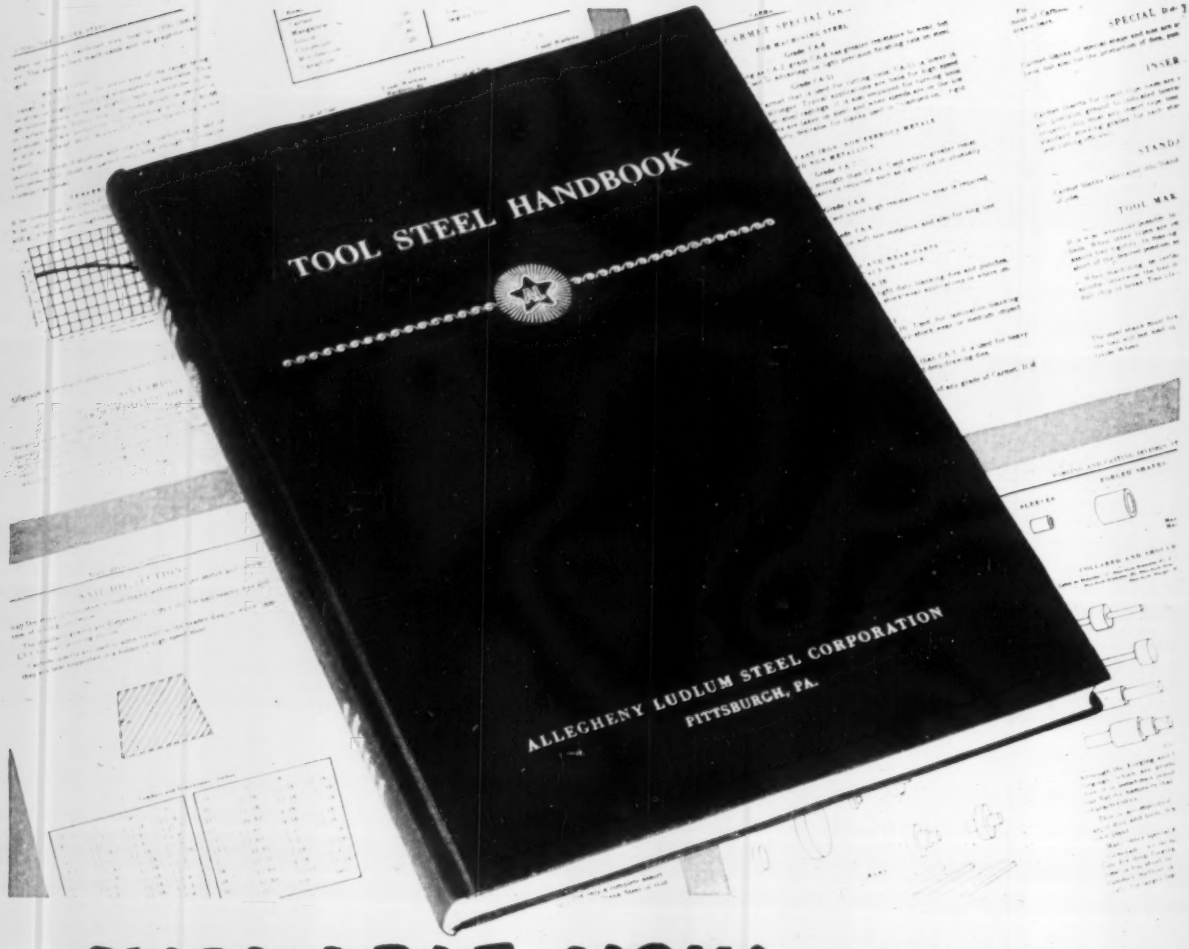
BAY STATE
WHEELS of PROGRESS

BAY STATE ABRASIVE PRODUCTS CO., Westboro, Mass., U. S. A.

Branch Offices and Warehouses — Chicago, Cleveland, Detroit, Pittsburgh
Distributors — All principal cities
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ont.

Safety literature available on all phases of grinding.

Manufacturers of all types of Quality Abrasive Products



AVAILABLE NOW—196 pages of Valuable Tool Steel Information

Another printing of our Tool Steel Handbook—one of the most comprehensive treatises of its kind ever offered by a tool steel producer—is just off the presses. In addition to a relatively complete picture of Allegheny Ludlum Tool Steels, their properties, applications and the forms in which they are available, this 196-page case-bound book presents an extensive discussion of heat treating and handling techniques as well as a complete set of weight tables and other useful reference material.

Your copy of the Tool Steel Handbook will be sent—*without charge*—upon request. Our only stipulation: please make your request upon your company letterhead. ● Write to *Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pennsylvania.*

ADDRESS DEPT. S-52

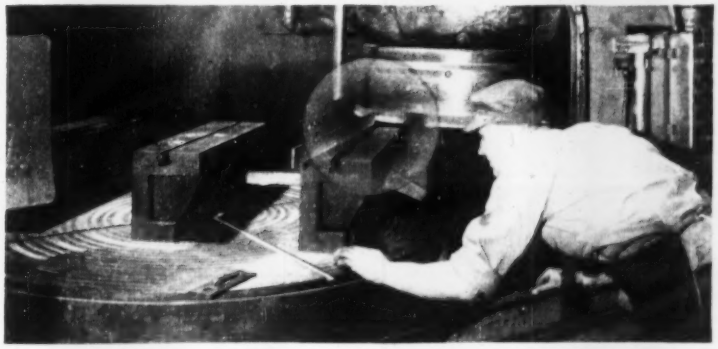
W&D 5125

For complete **MODERN** Tooling, call

Allegheny Ludlum

AL
FINE TOOL STEELS
SINCE 1854

"The new G Bond ALUNDUM wheels give us double the production of former standard wheels."* That's how a Massachusetts manufacturer sums up the performance of the new Norton wheels in grinding hardened high-speed steel textile blades. He adds: *"Wheels used on this job must be very free and cool cutting to avoid warping and burning the very thin stock."*



"I get a fast cut and good finish. They're the best and most versatile segments I ever used for this kind of work and I'm considering ten sets," reports an Illinois customer using G Bond segments for surface grinding mild steel, cast iron and Meehanite — all three.

NORTON ABRASIVES

Making better products . . . to make other products better

These users say:

For surface grinding, the new G BOND beats them all!

Latest Norton wheels bring you the money-saving "TOUCH of GOLD"

Naturally, we've kept close watch on how the new G Bond wheels are doing. And we can report that throughout the range of precision and semi-precision grinding applications they're already away out in front. In the field of surface grinding, for instance, a composite statement by users of the new G Bond would run very much like this:

"G Bond wheels cut freer, cooler, faster — enabling us to take heavier cuts in costly high speed steels without drawing temper. They give us closer tolerances and smoother finishes. They dress easier and produce more pieces per dressing. Doing more work and a greater variety of work — per wheel, they outlast any wheels we ever used before."

G Bond Wheels for YOUR Surface Grinding

will bring new speed and economy to surface grinding jobs — thanks to their unique grain-holding structure that produces greatly improved cutting action. Remember, the G Bond is the most modern, most efficient vitrified bond ever developed — a typical Norton "Touch of Gold" achievement that steps up grinding performance and product quality while cutting grinding costs.

See Your Norton Distributor

for the ALUNDUM G Bond wheels, cylinders and segments you need. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your classified phone directory. *Export:* Norton Behr-Manning Overseas Inc., Worcester 6, Mass. W-1537

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

At the NATIONAL SUPPLY COMPANY, Torrance, California

Flame hardening with *GAS* reduces highly specialized tooling

Flame hardening of a gear for a drilling rig rotary is accomplished at National Supply Company by means of a semi-automatic setup. The heated tooth is moved by an indexer to a water spray for quenching.

TO REDUCE THE NUMBER of highly specialized and costly tooling in a production of oil well drilling machinery, plant engineers of the National Supply Company have devised new methods of flame hardening which utilizes natural gas.

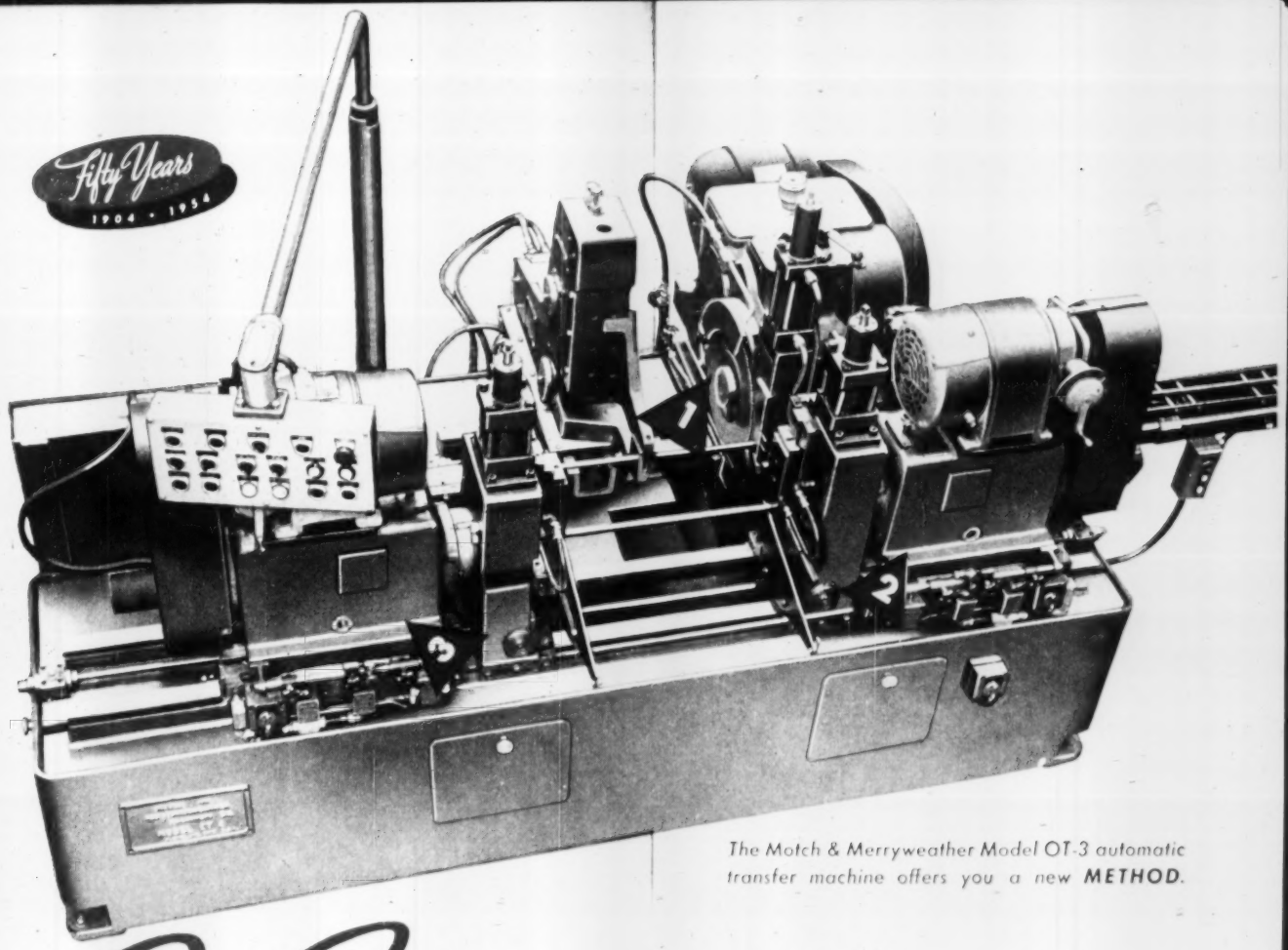
Using these methods, the flexibility of Gas permits the adaptation of a comparatively small number of versatile machines and burners to flame harden many different parts. The large variety of shapes and sizes and the relatively small number of parts of each type make the highly specialized tooling prohibitive in cost. To overcome this obstacle, Gas is mixed with oxygen in order to attain high enough temperatures to heat the surface of steel parts above the transformation temperature. Then, water or oil rapidly quenches the heated part to room temperature. This produces a continuous hard surface of uniform depth that will resist wear by abrasion over a softer, more shock resisting core.

This is but one example of the many ways in which Gas and Modern Industrial Gas Equipment are being utilized throughout the production lines of industry. For more information on how Gas is being used to increase the efficiency of heat treating production lines, contact your Gas Company Representative or Gas Equipment Dealer.

AMERICAN GAS ASSOCIATION • 420 Lexington Avenue, New York 17, New York

MORE AND MORE
THE TREND IS TO GAS
FOR INDUSTRIAL PROCESSING

Fifty Years
1904 • 1954



The Motch & Merryweather Model OT-3 automatic transfer machine offers you a new **METHOD.**

Buy Profits – PUT 3 HEADS TO WORK SIMULTANEOUSLY!

OPERATION: Cut off, chamfer inside and outside, and face.
MATERIAL: SAE 1020 steel tubing.
PRODUCTION: 140 pieces per hour.

Cut off to square, accurate, milled-finish lengths and double-end machine your work continuously, and simultaneously. Bore, face, chamfer, center drill, turn, ream, or groove singly or in combination. Cut-off time is virtually free. Save labor; save tooling, time, overhead, floor space.

THE MOTCH & MERRYWEATHER MACHINERY CO.

CLEVELAND 13, OHIO

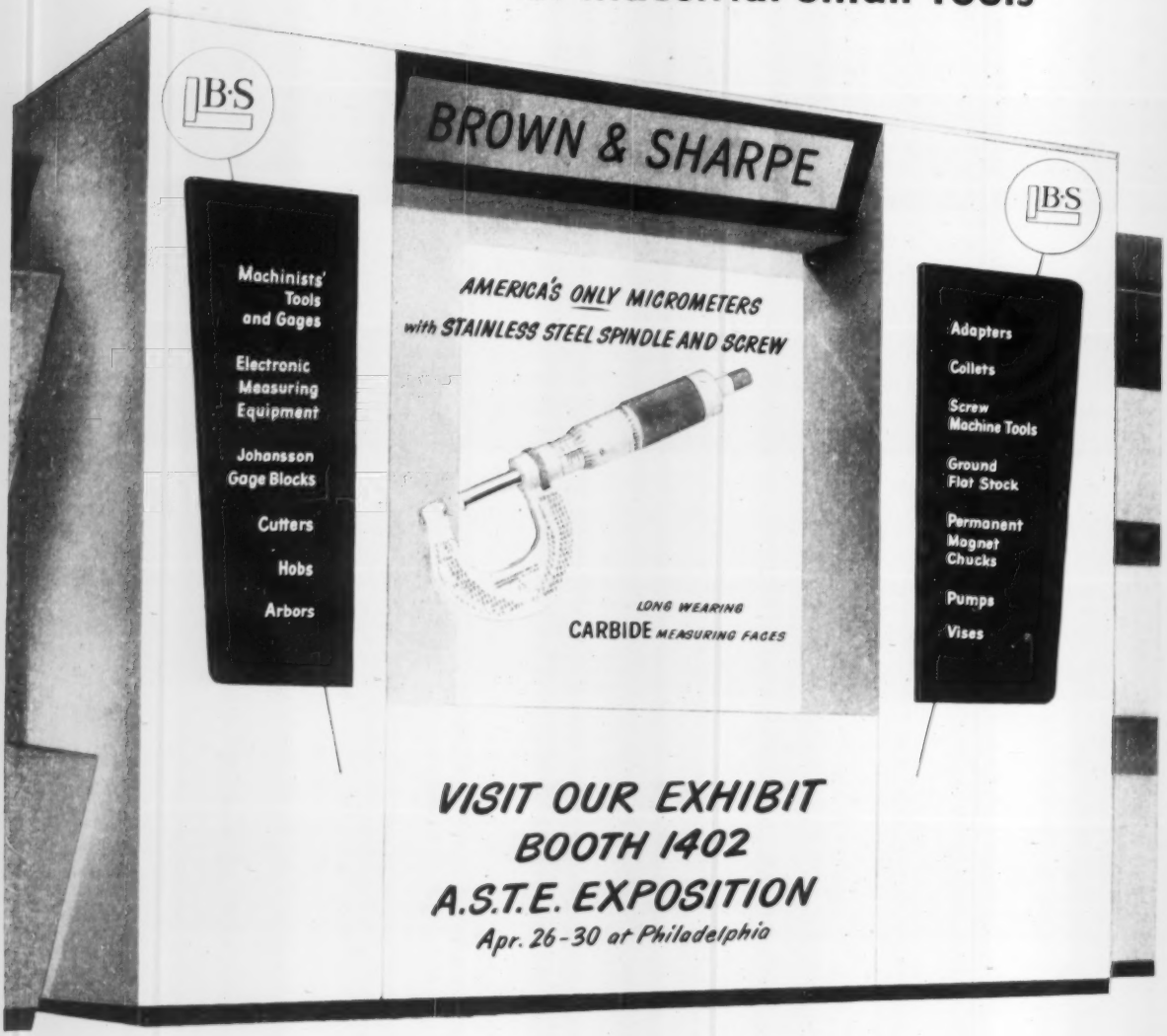
MP/SF
Most Production per Square Foot

OPERATION: Cut off, turn radius, chamfer and center drill one end; chamfer and center drill opposite end.
MATERIAL: SAE 1020.
PRODUCTION: 288 pieces per hour.

Builders of Circular Sawing Equipment, Production Milling, Turning and Special Machines

See

America's Most Complete Line of Industrial Small Tools



SEE OUR EXHIBIT
1954 INDUSTRIAL EXPOSITION
PHILADELPHIA CONVENTION CENTER
APRIL 26-30 incl.

featuring...

precision products that make possible the most efficient and economical production of accurate work

Brown & Sharpe

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LO-JET ACRO

Now! the new improved mist cooling system!

the revolutionary new coolant system that keeps cutting tools and work at below room temperatures... prolongs tool life, cuts tool breakage loss... saves money...speeds production...keeps work clean...protects operators and is fireproof!

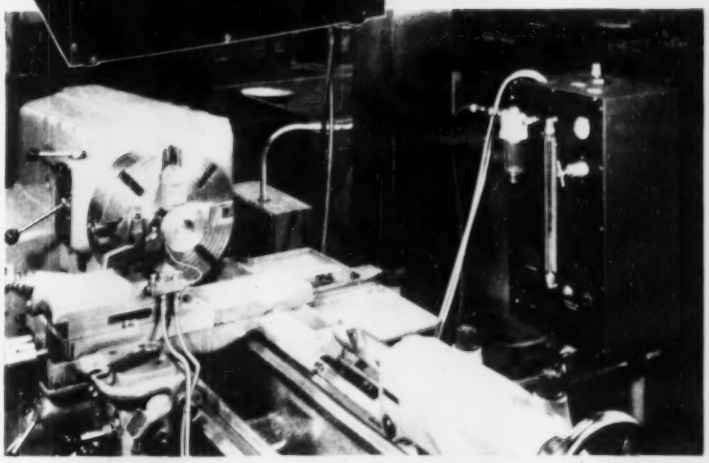
More efficient and adaptable—with separately controlled multiple spray heads. One nozzle can produce a true fog spray while another gives a liquid stream.

Easier to regulate—master panel control now makes every adjustment simpler, much more accurate. Spraymix control, attached by flexible tubes to top of unit, makes for easy positioning and precise, constant spray control.

More compact—all controls, regulators, gauges are **in one place**, at the operator's fingertips.

Smarter looking—a single neat, green wrinkle-finish case houses all mechanisms and controls. The new design eliminates excess piping.

Portable or stationary—mounting permits 'round-the-plant portability, and sturdy bracket mounting also provides for permanent one-location use. Both mountings come with unit.



LO-JET ACRO

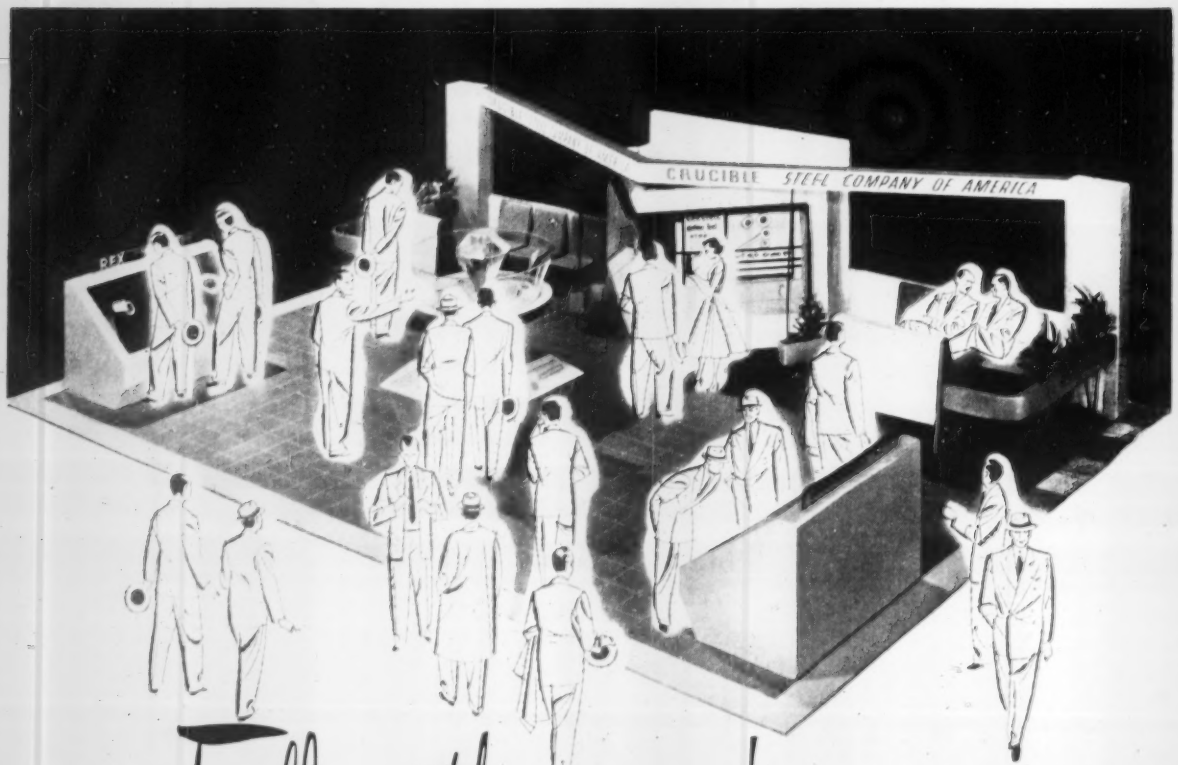
there's a Lo-Jet Acro system for every purpose, every machine— write now for details!

AIR CONVERSION RESEARCH CORPORATION
4107 NORTH DAMEN AVENUE
CHICAGO 18, ILLINOIS

SEE THE NEW LO-JET AT THE A.S.T.E. SHOW—DEMONSTRATIONS AT BOOTH 1251

Air Conversion Research Corporation S-4
4107 N. Damen Avenue, Chicago 18, Ill.
Gentlemen: Please send me full information about the new Lo-Jet Acro mist cooling system.

name and title _____
firm _____
address _____
city and zone _____ state _____



Follow the crowd

TO THE BIG CRUCIBLE EXHIBIT AT THE ASTE SHOW...

BOOTH 626

American Society of Tool Engineers Show

Convention Center, Philadelphia, Pa.

April 26-30

There are always worth-while things to see at the Crucible exhibit... and there'll be even more in the way of helpful material this year. Among other items, you'll find new exhibits and information on Rex high speed steels, tool steels — including hollow tool steel bars — and other special purpose steels.

You'll find, too, a group of experienced Sales Engineers and technical people who can help you with your application problems. So be sure and follow the crowd to the Crucible booth. We'll look for you.

Join your Civil Defense Team NOW!

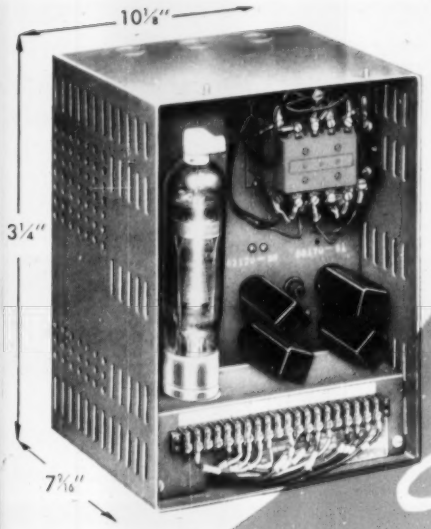
CRUCIBLE first name in special purpose steels

54 years of Fine steelmaking

TOOL STEELS

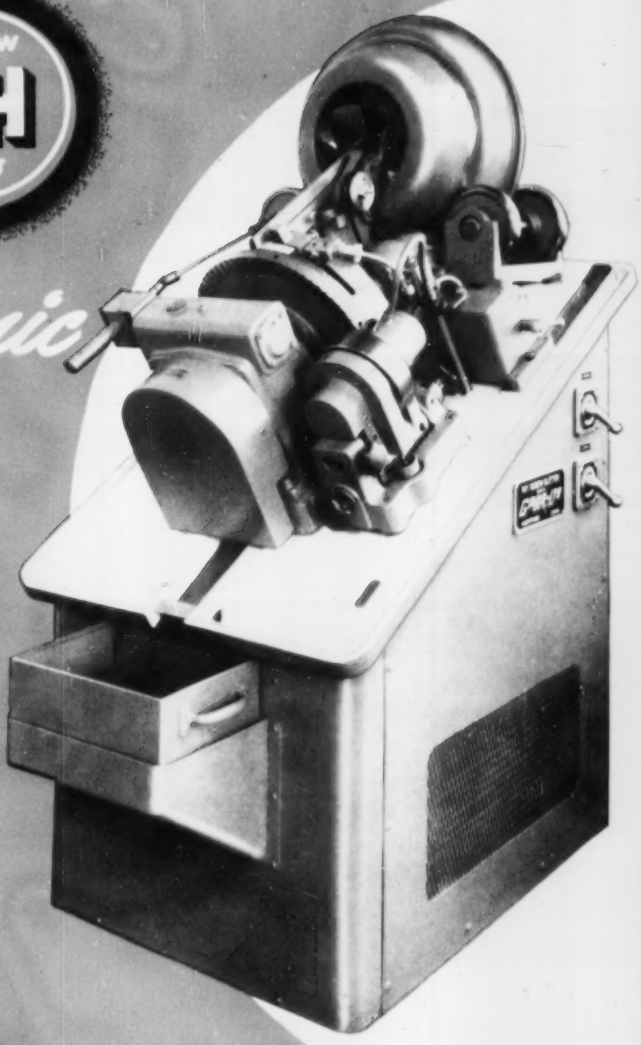
CRUCIBLE STEEL COMPANY OF AMERICA · TOOL STEEL SALES · SYRACUSE, N. Y.

ARROW·HART



ARROW AH HART

Electronic VARIABLE SPEED DRIVE



. . . the "BRAIN" that brings "AUTOMATION" to this new

One Machine does all this

- HANDLES ALL TYPES OF WOOD, SHEET METAL and MACHINE SCREWS
- SLOTS ALL HEAD SHAPES in ALL MATERIALS
- HANDLES ALL SCREW BLANKS from NO. 2 to NO. 12 and from ¼" to 1½" LONG
- ADJUSTS FROM 125 TO 720 PIECES PER MINUTE

BOTH THE WORK CARRIER WHEEL AND THE SAW HAVE FOUR SEPARATE SPEEDS THAT CAN BE INSTANTLY ADJUSTED INDEPENDENTLY OF EACH OTHER

} ROY SCREW SLOTTER

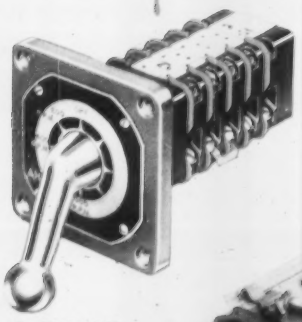
THANKS TO ARROW-HART VARIABLE SPEED DRIVE!

TURN THE PAGE FOR ADDITIONAL INFORMATION

Here's another important step in Machine Tool "AUTOMATION"

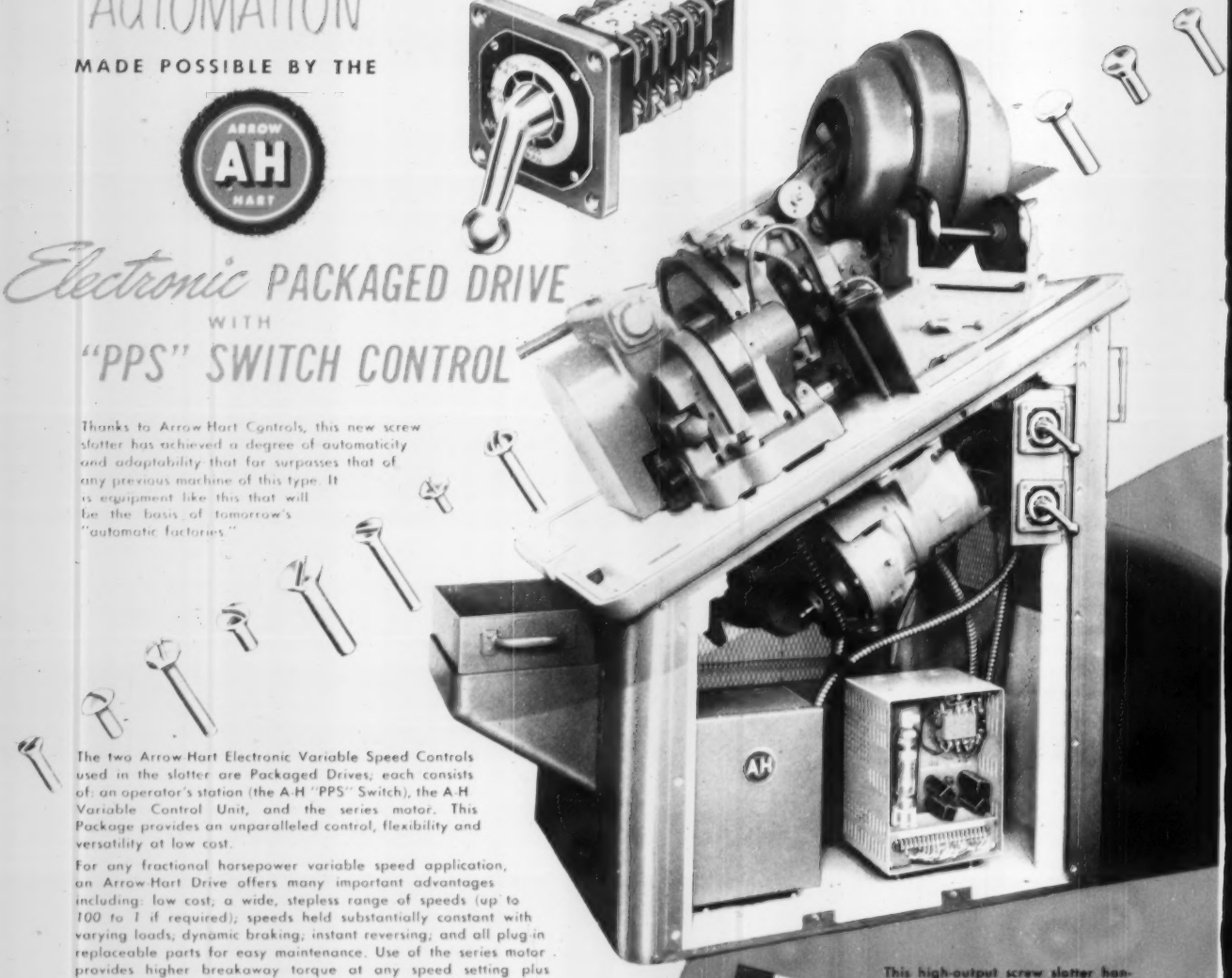
MADE POSSIBLE BY THE

ARROW AH HART



Electronic PACKAGED DRIVE WITH "PPS" SWITCH CONTROL

Thanks to Arrow-Hart Controls, this new screw slotter has achieved a degree of automaticity and adaptability that far surpasses that of any previous machine of this type. It is equipment like this that will be the basis of tomorrow's "automatic factories."



The two Arrow-Hart Electronic Variable Speed Controls used in the slotter are Packaged Drives; each consists of: an operator's station (the A-H "PPS" Switch), the A-H Variable Control Unit, and the series motor. This Package provides an unparalleled control, flexibility and versatility at low cost.

For any fractional horsepower variable speed application, an Arrow-Hart Drive offers many important advantages including: low cost; a wide, stepless range of speeds (up to 100 to 1 if required); speeds held substantially constant with varying loads; dynamic braking; instant reversing; and all plug-in replaceable parts for easy maintenance. Use of the series motor provides higher breakaway torque at any speed setting plus faster acceleration.

Especially where multiple operations or settings are required, the "PPS" Switch adds greatly to economy, versatility and efficiency. Acting in place of push buttons, relays and contactors, it provides safer, more convenient single point control. The operator can move from any position on the dial to any other position without activating any of the intervening circuits. Up to 16 positions are available from one compact control station.

This high-output screw slotter handles a wide variety of screw sizes, types and materials. Operation, including de-burring, is completely automatized. Screw blanks are simply placed in the hopper on the top; finished work is discharged into the work basket at the front. The machine is manufactured by the Gros-ite Manufacturing Company, Inc., Hartford, Conn., and is sold exclusively by Roy Machinery and Sales, Inc., also of Hartford.

Send Now FOR COMPLETE Control INFORMATION

AH

Industrial Control Division
THE ARROW-HART & HEGEMAN ELECTRIC COMPANY
103 Hawthorn Street, Hartford 6, Conn.

Please send me complete information about the Arrow-Hart

- ☐ Electronic Packaged Drive
- ☐ "PPS" Switch
- ☐ "RA" Motor Controls
- ☐ Push Button Controls
- ☐ Air Conditioning Controls

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THE ARROW-HART & HEGEMAN ELECTRIC COMPANY
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Sales Engineers in Columbus, O., Fayetteville, New York, Manchester, Ct., Seattle, Springfield, Mass., York, Pa.

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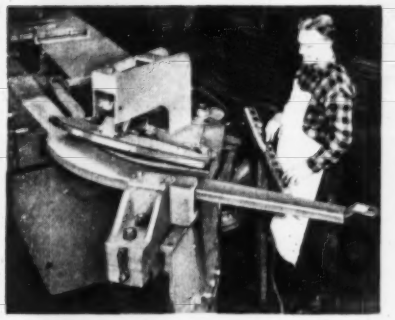
HOW MAJOR INDUSTRIES NOW CUT *Product Costs*

1 AIRCRAFT TUBING—Smooth, extra sharp bends now produced in ultra-thin stainless steel tubing, saves space and $14,000 per plane for aircraft manufacturer. Shown above, Pines Size 4 Unit forming wrinkle-free 8" c/l radius bend in 4" x .020" S. S. tubing.



2 HOLLOW TRACTOR BOOMS—Cold bending 12 ga. welded steel tapered tubes without distortion on Size 4 Pines unit eliminates expensive blanking and forming dies, saves tons of material for farm equipment manufacturer.

3 EXTRUDED WINDOW FRAMES — Part of production line setup in large aluminum fabricating plant, this small Pines Semi-Automatic saves space, accurately bends automobile window frame moldings.

with PINES PRODUCTION BENDERS

The examples shown here are a few of the countless number of production jobs that are now handled efficiently and more profitably on Pines Automatic Benders. They illustrate the versatility and the many cost-cutting advantages of cold forming round, square, rectangular, extruded, or hollow stock the "Pines-Way". Simplicity of tooling, uniform accuracy, and ease of operation are proven features of Pines machines which today help hundreds of plants cut product costs. At Pines you'll find an unmatched wealth of bending experience and creative tooling skill readily available to help you develop better methods and save time on production problems.

Write for *Free* data sheets

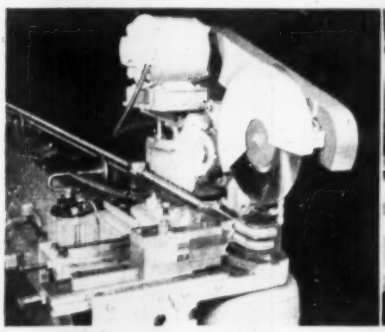
To keep abreast with latest developments in bending, write for copies of "Pines News" —bi-monthly mailing piece that gives facts on new, cost-cutting bending applications.

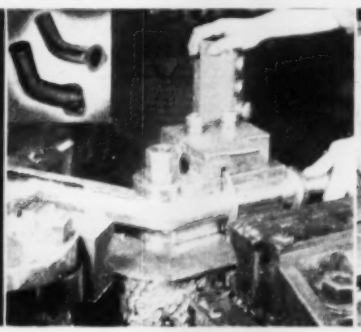
PINES ENGINEERING CO., INC.
Specialists in Tube Fabricating Machinery
662 WALNUT • AURORA, ILLINOIS

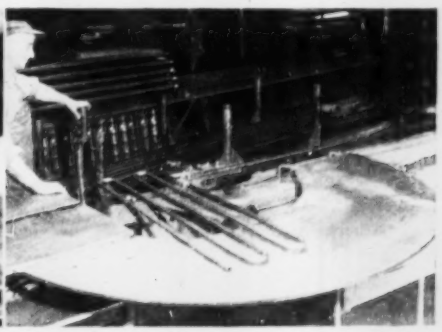
4 REFRIGERATION AIR CONDITIONING ELLS — Special Pines Automatic Cut-Off Benders now produce copper ells and return bends at speeds up to 1500 per hour, reduce scrap losses to 1%.

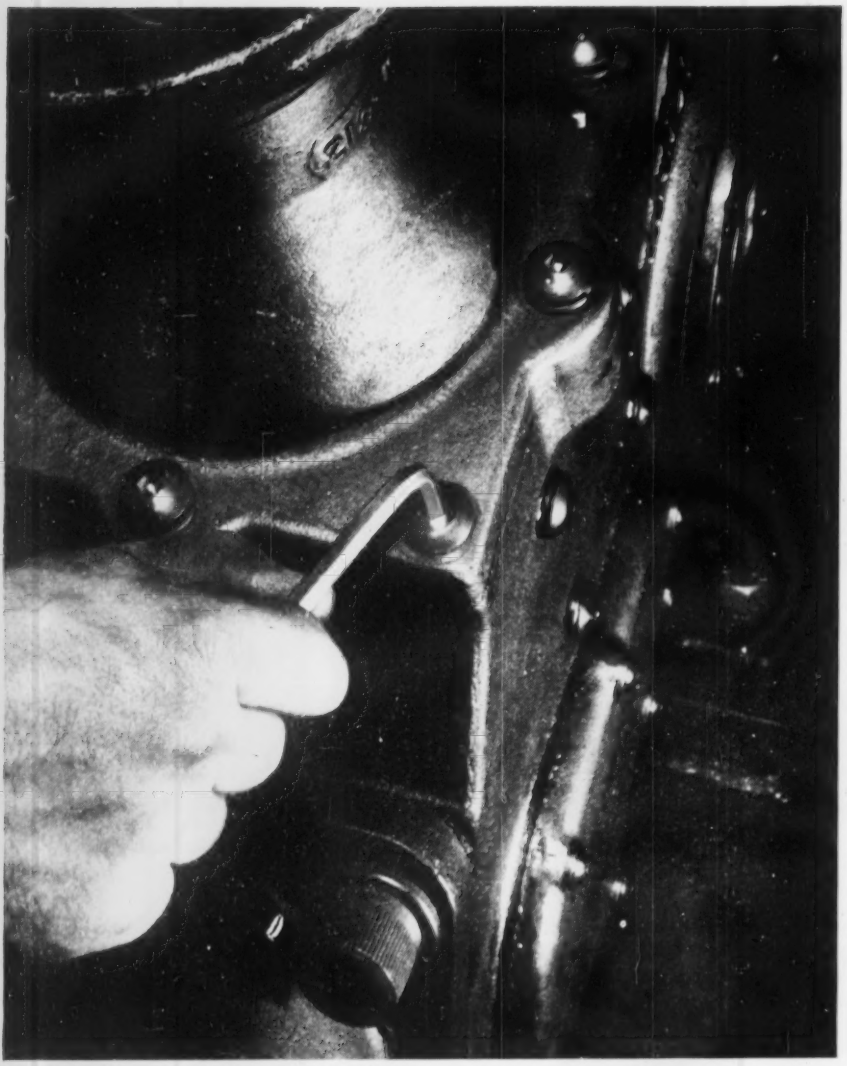
5 ENGINE MANIFOLD TUBES—Short 1⅛" O. D. steel tube now bent to 1½" c/l radius with flange attached saves space, insures accuracy, cuts costs.

6 BOILER TUBE AND REFRIGERATION COILS — Typical setup bending continuous serpentine coils from ¾" steel tubing. Reduces welding, fabricating costs. Other installations range from ¼" copper up to 3" steel tube.





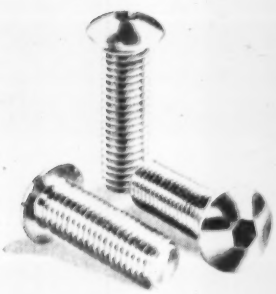




UNBRAKO **button head socket screws** are used exclusively to assemble this controlled volume pump, which was designed to fill the growing industrial need for the pumping of an allotted quantity of liquid at higher pressures, higher capacities.

The assembler inserts the UNBRAKO button head socket screw with his fingers, and runs it down as far as he can.

He then tightens it with a standard UNBRAKO key. Once seated, the low head design of the UNBRAKO button head provides a smooth, streamlined appearance.



UNBRAKO Button Head Socket Screws are made of heat treated alloy steel; have fully formed threads, Class 3 fit; are available in standard sizes from # 8 to 5/8". Accurate hex socket provides nonslip drive, prevents marring or mutilation of the head.

Save inventory dollars

Use UNBRAKO Standards—stocked by your distributor

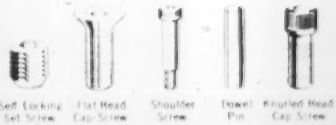
Not only does your UNBRAKO distributor lower inventory investment, he also saves you time—and provides latest information about products, cost-saving methods, production techniques, current problems, trade practices. For latest data on UNBRAKO standard socket screw products, consult him or write STANDARD PRESSED STEEL COMPANY, Jenkintown 33, Pennsylvania.

See us at Booth 1539, Convention Hall, Philadelphia, Pa., during the A.S.T.E. Show, April 26 to 30.

UNBRAKO **SOCKET SCREW DIVISION**

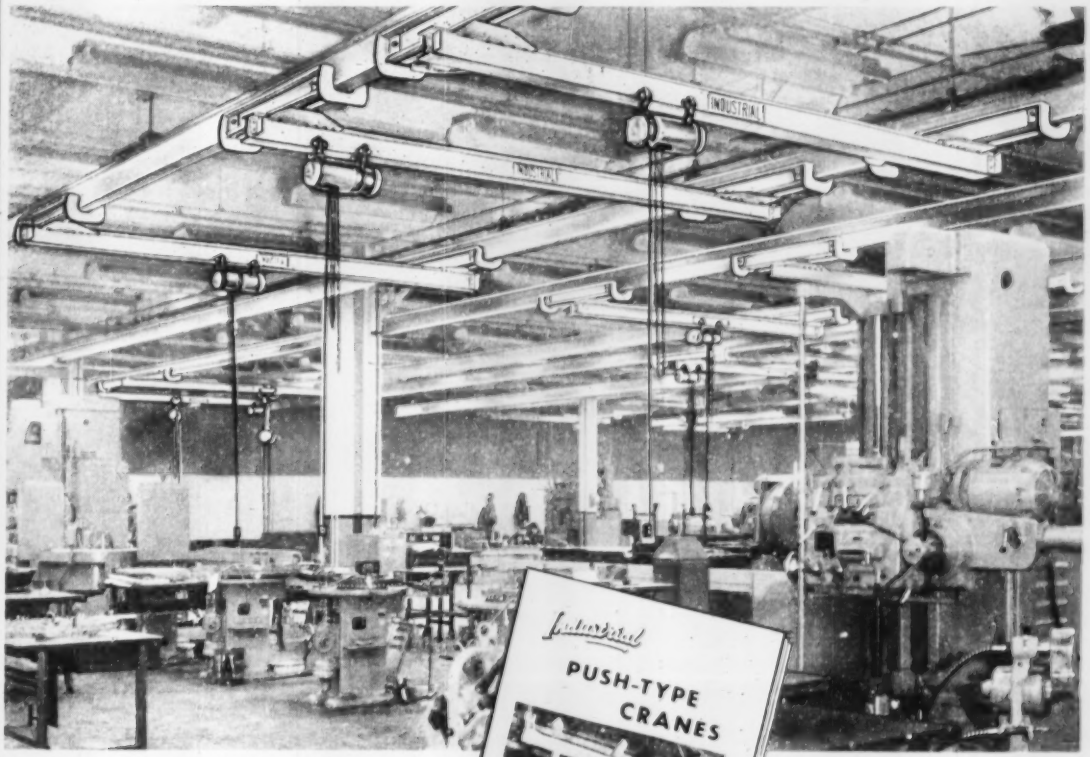
SPS

JENKINTOWN PENNSYLVANIA



Industrial PUSH-TYPE CRANES

SOLVE MANY MATERIALS HANDLING PROBLEMS



The Overhead Cranes shown in the above photo are a part of the 250 Industrial Push-Type Cranes installed in this modern plant.

Industrial Push-Type Cranes are available in 3 types—a light duty model in capacities to 4000 lbs.—and two heavy duty models in capacities to 8000 lbs.

Economical, rugged and dependable, Industrial heavy duty Push-Type Cranes are equipped with precision made end trucks for smoothest performance. Designed to function well with either hand operated or electric hoists.

Thousands in use throughout industry.

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Send copy of Push-Type Crane Bulletin No. PT 1253

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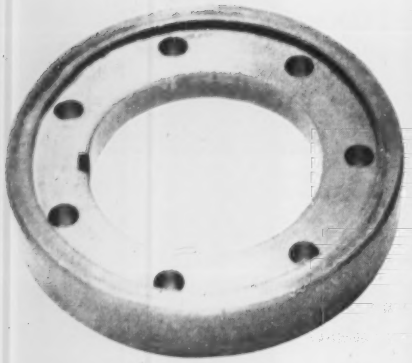
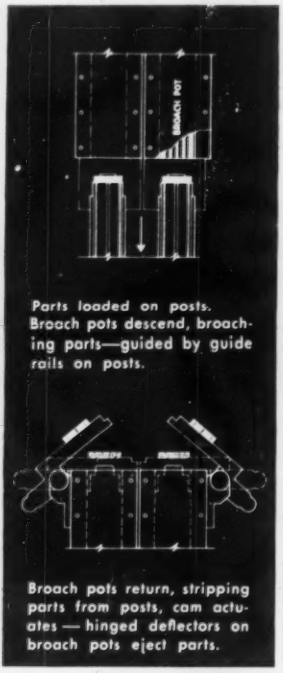
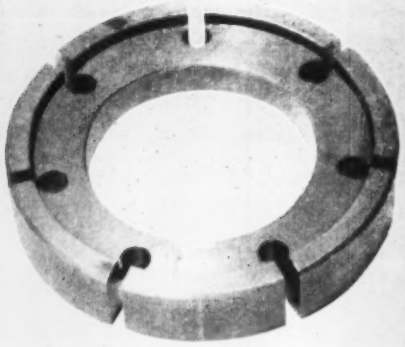
ANOTHER *American* FIRST




BROACH POT
Parts loaded on posts. Broach pots descend, broaching parts—guided by guide rails on posts.
Broach pots return, stripping parts from posts, cam actuates — hinged deflectors on broach pots eject parts.

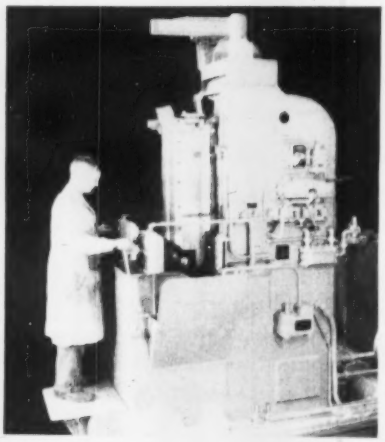


an *American* "special" broaches

7 slots each pass; 320 parts per hour

Seven external slots are broached on a pump rotor part by this American special two-station 42" stroke, 10-ton broaching machine. Fixtures are designed as posts fixed to the machine base and contain guides for guiding the moving broach pots during the machine stroke.

The operation is very simple—the operator loads two parts and starts the broaching cycle. Safety wedges, which prevent the broach pots from moving down while the operator loads, retract and the broach pots move down broaching the parts. On the return stroke the ejector mechanism strips the parts from the posts and then flips the parts to the side as the broach pots move up. The operator reloads and the cycle repeats, producing 320 parts per hour, when operating at 100% efficiency.



You can benefit from the American-Way when you want high production at low unit cost. Send a part print or sample for the recommendations of the company that engineers and builds all three — broaching machines, broaches and broaching fixtures. Write today. There is no obligation.

AMERICAN *American* BROACH & MACHINE CO.

A DIVISION OF SUNDSTRAND MACHINE TOOL CO.

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You'll find your products easier and cheaper to produce . . . more durable, better looking . . . if you make them with Weirkote. Get the facts today from your Weirton representative, or write Weirton Steel Company, Weirton, West Virginia.

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For better products

Weirkote is available in coils and cut lengths: gauges 16 to 30 inclusive. Maximum width—42", maximum cut length—168". Weirkote can be obtained to fit any customer requirement. For standard roofing and siding it is guaranteed to conform to A.S.T.M. specification A361-52T.

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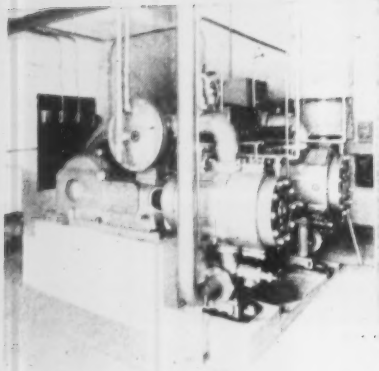
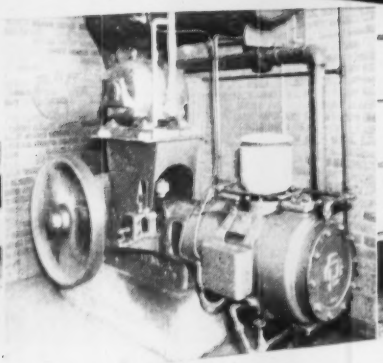
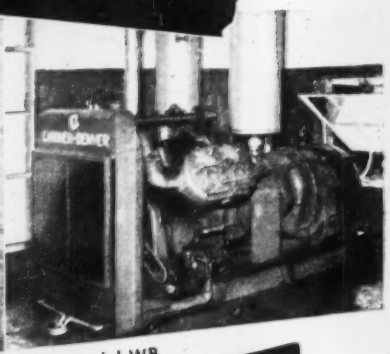
NEED A CENTRAL COMPRESSED AIR SYSTEM?



Model HA

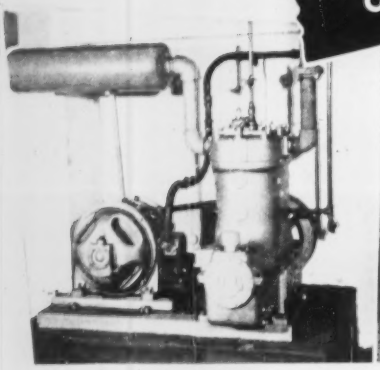


Model RX

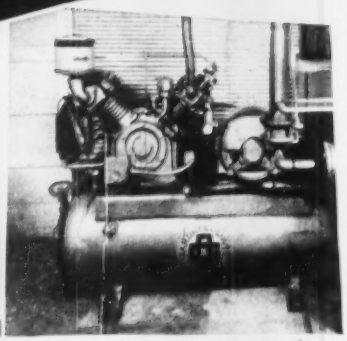


Model WB

OR DEPARTMENTAL COMPRESSORS?



Model AA



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for expert advice in planning your compressed air system — and for quality compressors to meet your capacity and pressure requirements. Write today!

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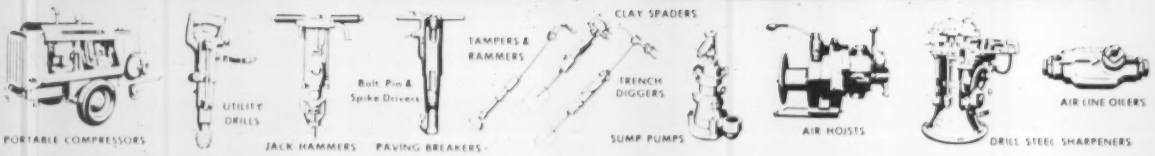
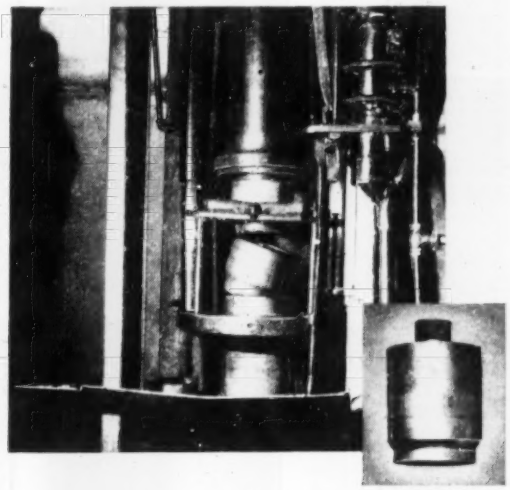


THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada) Ltd., 14 Curity Avenue, Toronto 16, Ontario

Look How You Save by Hard-Facing

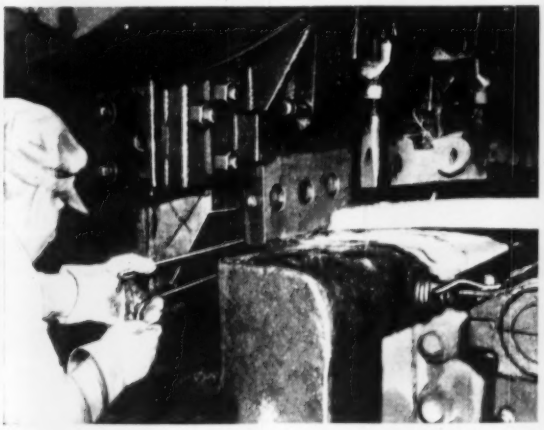


PRODUCTION LIFE INCREASED 1000%

This hard-faced punch mandrel has produced 10,000 pipe couplings and still shows no sign of losing gage. Unprotected tool-steel mandrels wore out after punching only 1000 pieces, and case-hardened mandrels punched only 500 pieces before they had to be replaced. A 3/16-in. layer of HAYNES STELLITE hard-facing alloy protects the mandrel from wear and galling.

SAVES $4000 PLUS

Rebuilding this worn extrusion screw with HAYNES STELLITE alloy No. 1 cost $2000—$4000 less than a new screw would cost. And the rebuilt screw will give from 4 to 6 times more service than a new, unfaced screw. The screw is used to extrude rubber from a solid to a semi-liquid state. Wear is the chief problem, and it is effectively resisted by the hard-faced surfaces.



SHEAR 4 TIMES THE TONNAGE

These hard-faced blades shear an average of 200 tons of tough alloy billets. This is more than 4 times the average for special steel blades. Hard-facing with HASTELLOY alloy C protects the blades from wear, and they keep a keener cutting edge longer. When the blades finally do wear, they can be hard-faced again at a fraction of their replacement cost.

FREE —

Write for the 80-page "Haynes Hard-Facing Manual."

HAYNES

Trade-Mark

Hard-facing products made from cobalt-base alloys, nickel-base alloys, and tungsten carbide in the form of rod, wire, and coils.

"Haynes," "Haynes Stellite," "Hastelloy" are trade-marks of Union Carbide and Carbon Corporation.

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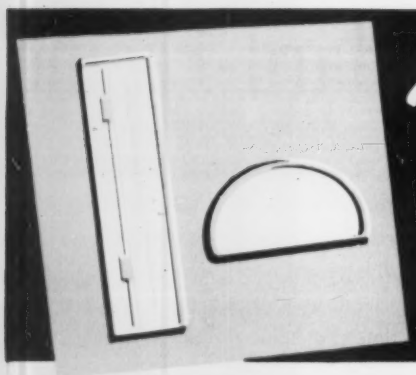
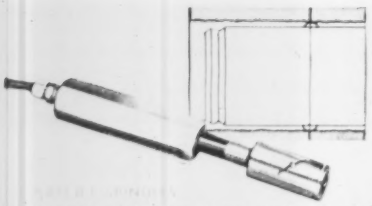


Modernize FOR LOW COST PRODUCTION with Newest Developments In Air Gaging

Already these newly developed practical precision tools are helping produce more and better products at lower cost in innumerable plants throughout the world.

Space restrictions here preclude anything more than the briefest description. Phone, wire or write for specifications, prices and delivery—or call the Sheffield sales engineer in your vicinity.



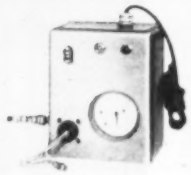
For checking holes having finishes rougher than 65 micro inches, for porous parts, narrow lands or checking to the very end of a hole. Setting is made with gage blocks and a Standard Calibrator. NO MASTER SETTING RINGS REQUIRED . . . not even one.

One, two, three or four spindles may be quickly assembled from components in the kit, for any size between 1 and 3 inches. Gage blocks are used to set for size and to calibrate air gage for amplification.

A light, high precision (2,000 to 1 amplification) self-centering bore gage that is easily adjustable from 3" to 12" in diameter. Calibrated by a Standard Calibrator and gage blocks.

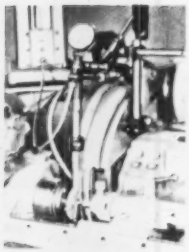
Replaces an indicator where more accuracy and higher amplification are required. Always gives precise readings regardless of the direction of approach. No lag. No years of nothing to wear out of adjustment. Amplifications up to 5,000 to 1.

Converts air pressure variations at the gaging contact into electrical impulses which actuate classification and segregation mechanisms or machine control devices. Accurate to a fraction of a tenth.

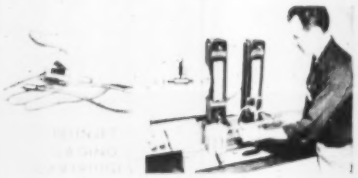


A self contained unit of Airelectric Head, indicating dial and signal lights. Easily mounted on the machine to control machine operation by precision measurement of the machined surface. Makes machining automatic. Also used for automatic gaging and segregating.

The key element of the machine "feed gage" which eliminates error due to feed screw wear. Also due to the high amplification, makes it easy to manually control the feed to fractional limits.



Air Gaging Cartridges are used with Caliper Gages for continuous gaging of work on external grinders. Dial is used for approach. FEEDRITE brings to final size.



Precise, low cost gaging elements which you may incorporate in your own gaging fixtures singly or in multiple to measure practically any dimension or geometrical relationship, with tolerances ranging from .0005 to .200.

GAGE DIVISION, The Sheffield Corporation
Dayton 1, Ohio, U.S.A.

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SHEFFIELD HEADQUARTERS — MASTER CRAFTSMAN

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more dependable

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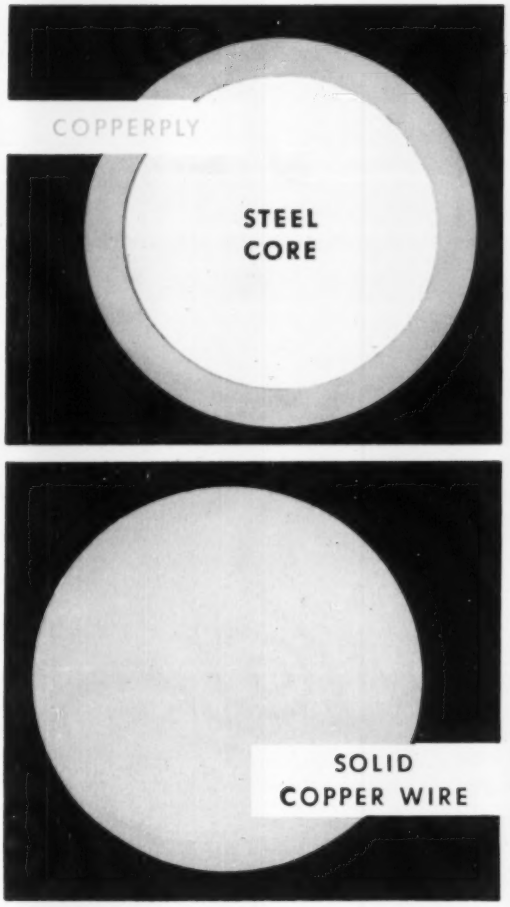
A NEW COPPER-PLATED STEEL WIRE OF UNMATCHED NATIONAL-STANDARD QUALITY



COPPERPLY, accurately concentric and uniform, is steel wire electroplated with copper to the thickness required. This type wire was originally used for television lead-in installations. Now this unique wire is solving cost problems in many new applications.

Maybe COPPERPLY gives you ideas for applications in your field . . . uses that will result in substantial savings over solid copper wire.

In addition to cutting costs, COPPERPLY obviously is much stronger than copper wire. And National-Standard makes it with a regular or high tensile steel wire core to fill your specific requirements.

We'll "loan" you an engineer to help you develop any ideas for using COPPERPLY you'd like to explore. It's company policy to give the best service in the industry, in addition to the highest quality special wire and steel products available. Write the National-Standard Company, Niles, Michigan, concerning COPPERPLY. Write the appropriate division listed below on other products.

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Reynolds Wire, Dixon, Illinois
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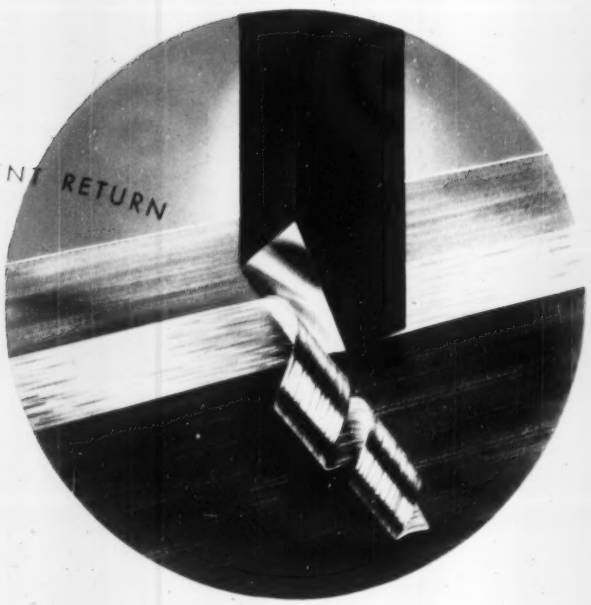
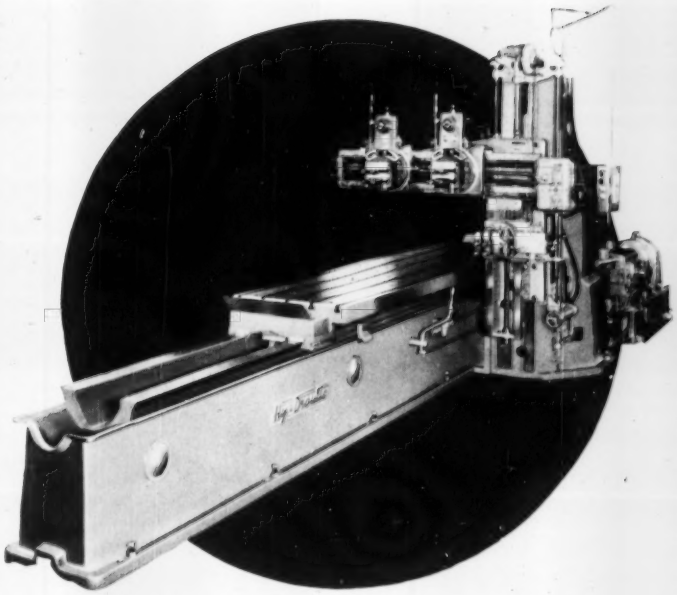
hydraulic drive . . . a natural for



Rockford Machine Tool Co.

reciprocating machine tools

Hydraulic Drive and Feeds, as basic features in modern machine tool design, provide outstanding performance, measured in terms of work quality, high production and low operating cost.
We have had over 25 years of experience in applying Hydraulic Drives and Feeds to Shapers, Planers and Slotters.



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Simplified Controls
Quick Set-Up
Fast Operation
Stepless Speeds
Smooth Cutting
Fast Reversals
Long Tool Life

Unmatched for the efficient, economical handling of work that is somewhere in size between shaper and planer capacities.

shaping / planing / duplicating / turning

our 52nd year

Rockford, Illinois

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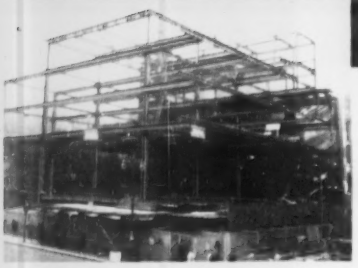

● *The Manufacturers Trust Company building at Fifth Avenue and Forty-Third Street in New York is a fine example of modern design. Architects: Skidmore, Owings & Merrill. General Contractors: George A. Fuller Company. Structural Engineers: Weiskopf & Pickworth.*

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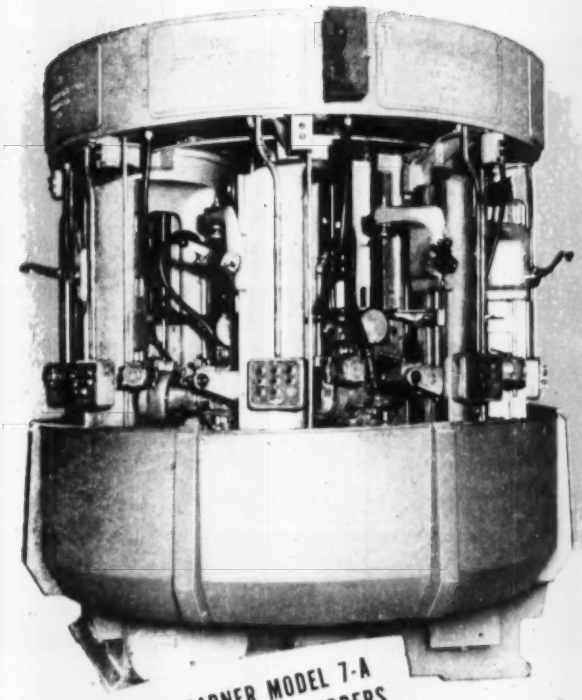
Engineered for Today with Reserve Capacity for the *Future*



LEES-BRADNER MODEL 7-A 8-SPINDLE ROTARY HOBBERS

- Push-button production controls
- Electric hob shifter
- Electronic counter for longer hob life
- Patented automatic hob in-out mechanism

Things are moving fast these days. The car that was so spanking new and modern yesterday is "old hat" when the new models come out.

The same could be said for machine tools. That's why it's important to *look ahead* when buying machines. To ask *more* than "What can it do today?" Tomorrow comes fast and it's important that the tools you buy now have the reserve capacity for your future needs.

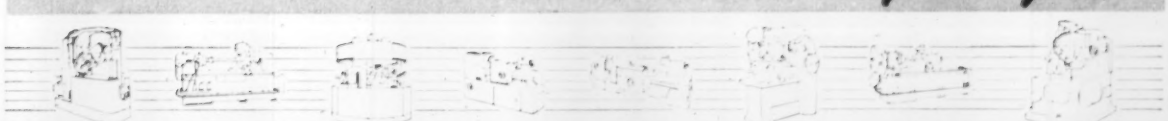
Lees-Bradner hobbing machines are *engineered* for extra capacity. They're built to run longer and at greater speeds than other machines of their type. And because they are semi-automatic the labor savings are considerable.

That's why we can say that when you buy a Lees-Bradner hobber you're buying not only for today but for tomorrow, too.

Your Lees-Bradner representative will be glad to give you the facts. Or write us direct.

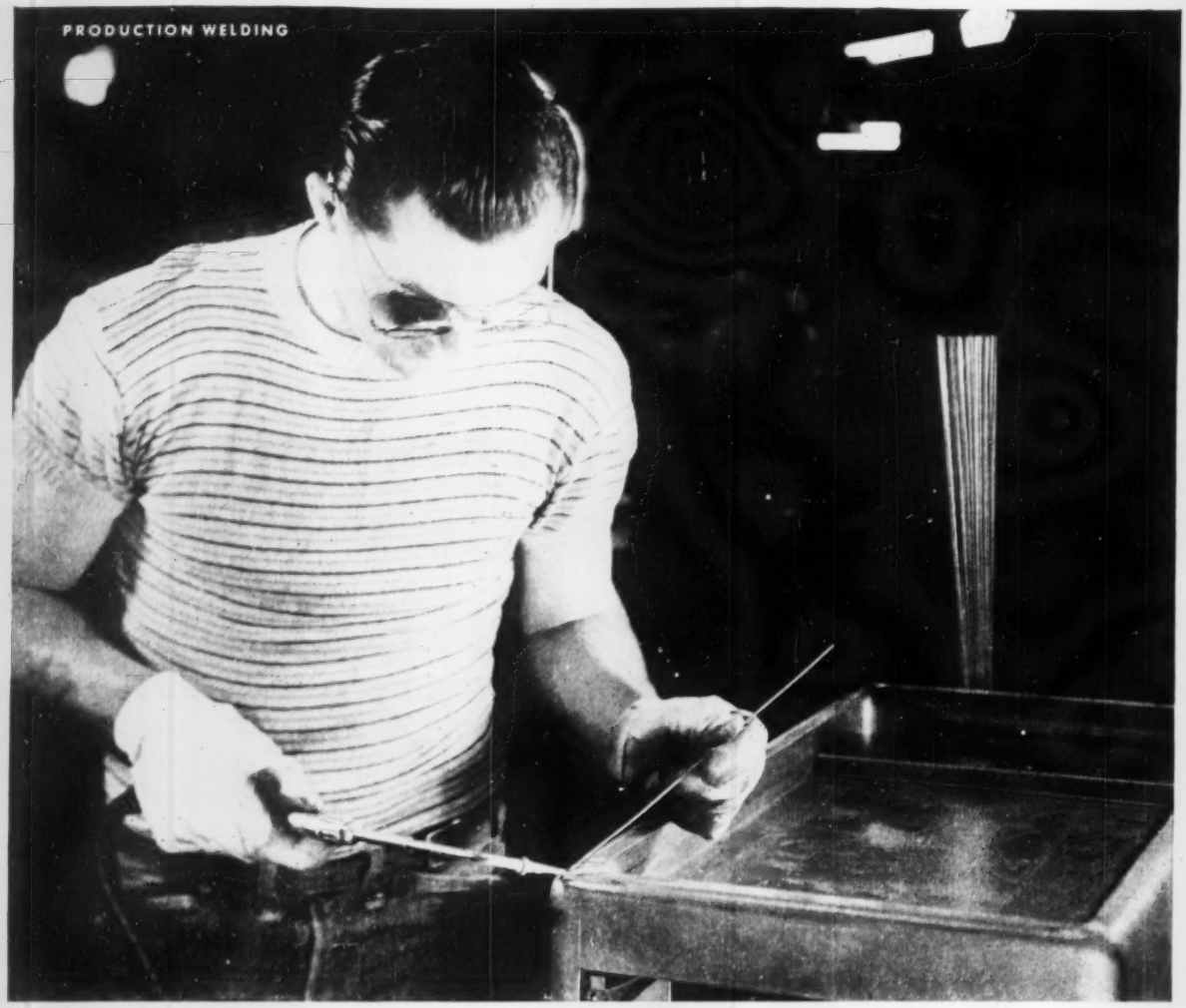
the LEES-BRADNER Company

CLEVELAND 11, OHIO, U.S.A.

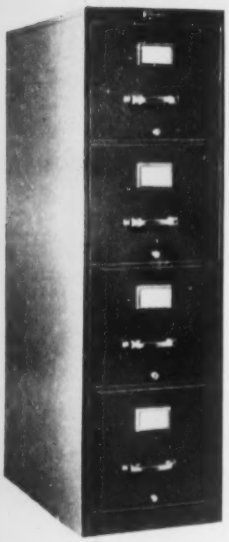


MODEL 8 HOBBER · HT THREAD MILLER · 7 A ROTARY HOBBERS · CRI-DAN THREADING MACHINES · MODEL 40 THREAD MILLER · SH SPLINE HOBBER · 12 S HOBBER

IF YOU THREAD OR HOB . . . GET A BETTER JOB WITH A LEES-BRADNER



STRONG JOINT on desk housing is made with Tobin Bronze Welding Rod.



COLUMBIA Steel Office Equipment Co. also produces attractive filing cabinets like this one by braze-welding with Tobin Bronze Welding Rod.

Office equipment maker uses Tobin Bronze to braze-weld stronger, cleaner joints

On desks and filing cabinets it's important that all corner joints have adequate rigidity and strength, and that they look clean and neat after enamel finishing. Whether they will or not depends largely on the welds at these points.

Columbia Steel Office Equipment Co., Philadelphia, has this problem licked. First, they spot-weld all desks and filing cabinets. Then, units are braze-welded with Tobin Bronze* Welding Rods (3/32 in.). Columbia says, "Braze-welding with Tobin Bronze provides greater strength at the joints . . . helps to make our equipment more attractive. Our work goes faster, too. Tobin Bronze flows freely, 'tins' quickly, gives strong, neat bonds. Braze-welding with Tobin Bronze is the fastest, most economical way we've found to do the job."

ANACONDA Welding Rods for many types of production and repair jobs are available from distributors throughout the United States. *The American Brass Company, Waterbury 20, Conn.* In Canada: *Anaconda American Brass Ltd., New Toronto, Ont.*

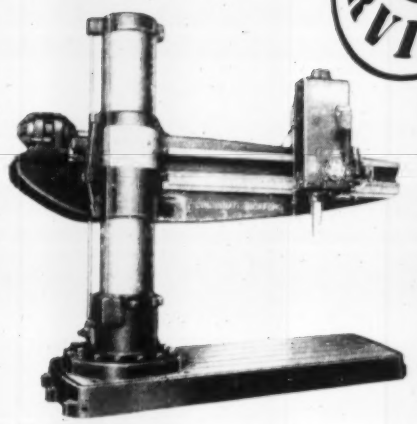
*Reg. U. S. Pat. Off.

Welding Rods

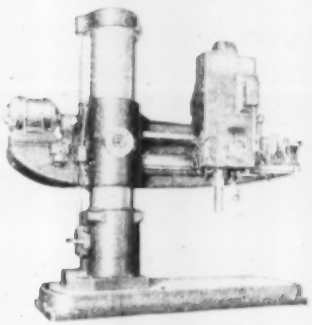
Anaconda Copper-372 • *Tobin Bronze-481* • *Anaconda-947 Low Fuming Bronze* • *Nickel Silver-828* • *Cupro Nickel-826* • *Everdur-1010* • *Ambralun-928* • *Phosphor Bronze-351* • *Phosphor Bronze-534*

There's a SUPER SERVICE for your job...

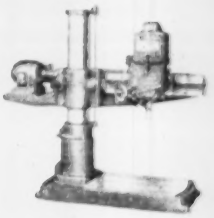
For greatest savings in drilling cost The Cincinnati Bickford Tool Company offers a complete line of 34 different sizes and types of drilling machines. One of these machines will cut your drilling costs. Our engineers will help you select the proper machine for your work. Write for bulletins on the machines that interest you.



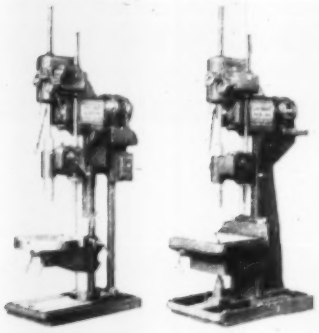
The SUPER SERVICE Master Radial Drill, as described in Circular R-22, is built in 7' to 12' arm lengths and in 22" and 26" diameter columns. This machine has 36 speeds and 18 feeds powered by motors from 20 to 40 HP.



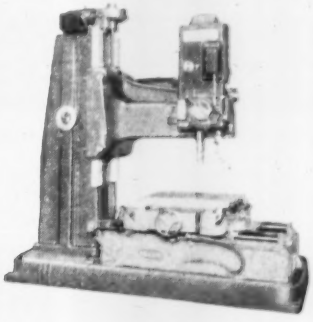
The 36-speed 18-feed SUPER SERVICE Radial Drill, as described in Booklet R-29, is furnished in 13 different standard sizes, ranging from 3' to 8' arm lengths and 11" to 19" diameter columns. These machines are furnished with 7½ to 20 HP driving motors.



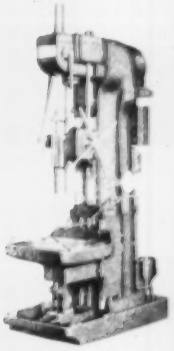
The 9" Diameter Column SUPER SERVICE Radial Drill, as described in Circular R-21C, is built in either a 3' or 4' arm length with 9 speeds and 4 feeds powered with a 3 HP driving motor.



The SUPER SERVICE General Purpose Upright Drilling Machines, as described in Booklet U-25, are furnished in 21", 24" and 28" sizes. From 8 to 12 speeds and 4 to 9 feeds. The machines are powered by either 3, 5 or 7½ HP motors.



The new SUPER SERVICE Precision Drilling Machine is especially suited to operations in conjunction with an automatic spacing table. This 36-speed 18-feed 15 HP motor machine is more completely described in Circular FH.



The SUPER SERVICE High Production Manufacturing Type Uprights have many of the advantages of the general purpose drilling machines but, due to their simplified construction, they are much more economical. They are furnished in 21", 24" and 28" sizes with 3, 5, 7½ or 10 HP driving motors. Booklet U-27 will furnish you more complete details.

CINCINNATI BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

THE ONE YOU WANT?

He has it!

NO NEED to search through directories or ask people about it. When you need a finished bearing, a bar of bearing bronze or any other one of countless items of industrial materials and equipment, just phone your industrial distributor.

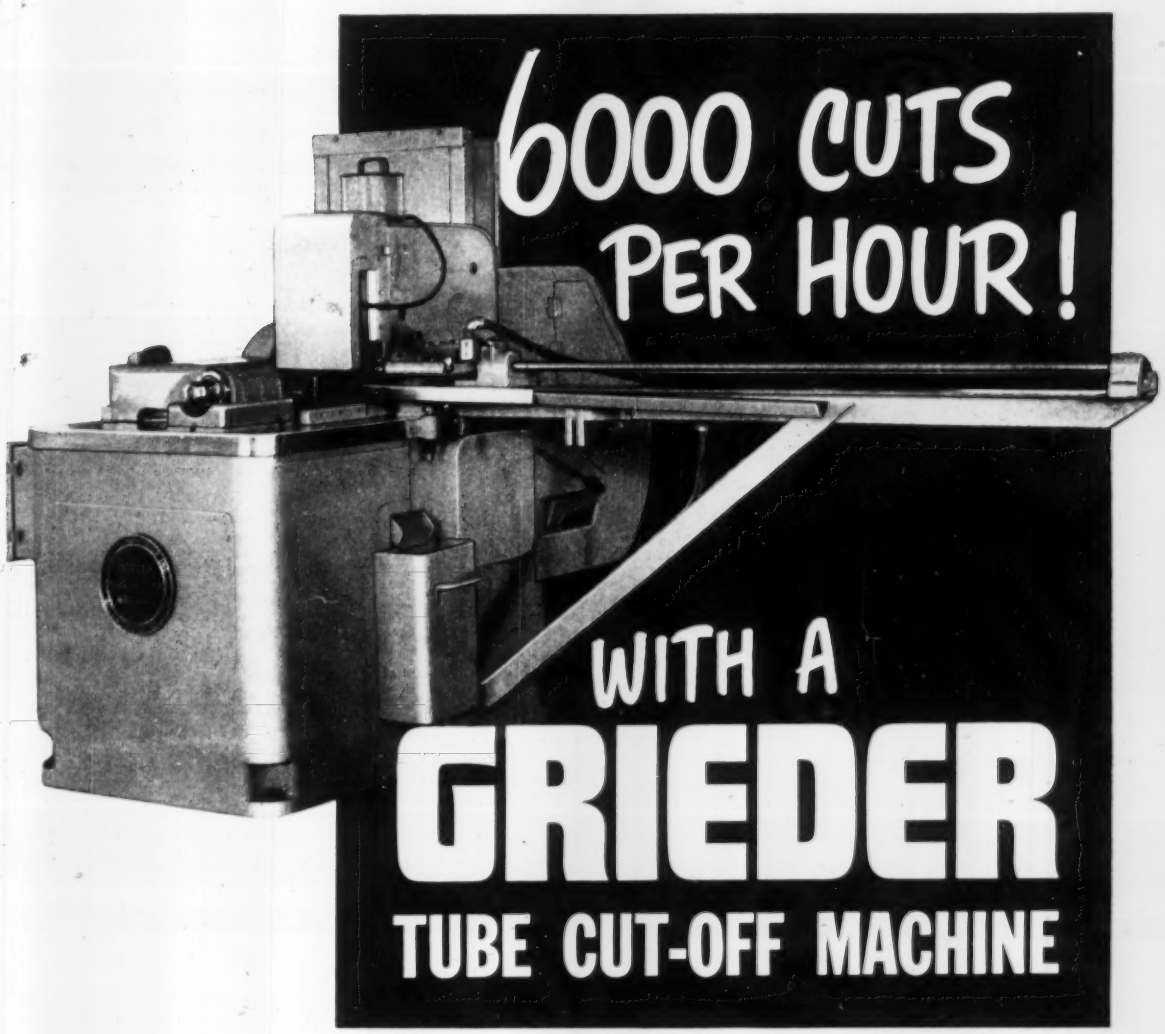
YOUR BUNTING distributor is the leading industrial distributor, or a stock-carrying specialist in certain industrial items. With money-saving convenience, he can supply hundreds of different sizes of completely machined and finished Bunting Standard Stock Industrial Bearings, Electric Motor Bearings and Precision Bronze Bars.

Ask him for a Bunting Catalog which gives complete dimensional and technical data.

Bunting®

BRONZE BEARINGS • BUSHINGS • PRECISION BRONZE BARS

The Bunting Brass & Bronze Company • Toledo 1, Ohio • Branches in Principal Cities • Distributors Everywhere

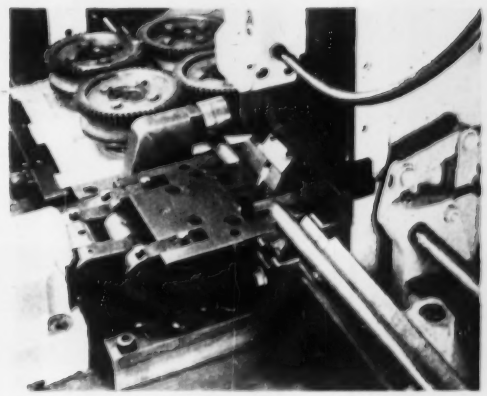


6000 CUTS PER HOUR!

WITH A GRIEDER TUBE CUT-OFF MACHINE

NO DISTORTION... MINIMUM BURR...
ACCURACY WITHIN .002"...
CUTS ANY SHAPE...

Cut steel tubing at the amazing speed of 6000 cuts per hour. The Grieder Tube Cut-Off Machine features a heavy duty air operated combination clutch and brake unit that allows continuous operation at this terrific rate of production. Fully automatic . . . Rate of feed: 600 feet per minute . . . True cutting. Get full information, multiply your tubing production, reduce costs, write *today*.



GRIEDER INDUSTRIES, INC.
BOWLING GREEN, OHIO
SALES OFFICE: 309 RICHARDSON BLDG., TOLEDO 4, OHIO

start with JALCASE

for better results use

the J&L cold finished steel

with a reputation for:

- easy, consistent machinability
- good heat-treating properties
- high cold-drawn physical properties
- wide range of applications

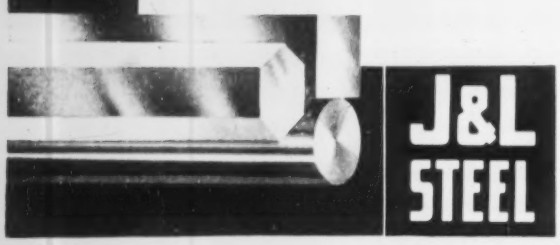
Jalcase was developed in J&L's metallurgical laboratories to meet the need for a free-cutting open-hearth steel with the mechanical properties required for high quality machined parts.

Today, specifications are standardized within the steel producing industry and S.A.E. and A.I.S.I. numbers have been assigned:

LOW CARBON GRADES		HIGH CARBON GRADES	
Jalcase Designation	*A.I.S.I.* Number	*Jalcase* Designation	*A.I.S.I.* Number
Jalcase—1	C-1113	Jalcase—7	C-1137
Jalcase—2	C-1114	Jalcase—8	C-1141
Jalcase—3	C-1116	Jalcase—9	C-1144
Jalcase—4	C-1117		C-1144 specially Processed
Jalcase—5	C-1118	Jalcase—10	
Jalcase—6	C-1119		

And, J&L's Jalcase continues to maintain leadership in this group of steels.

When you specify "JALCASE," you can depend upon those qualities that help you obtain better production . . . longer tool life . . . lower overall costs. Remember to say "JALCASE" when you order.

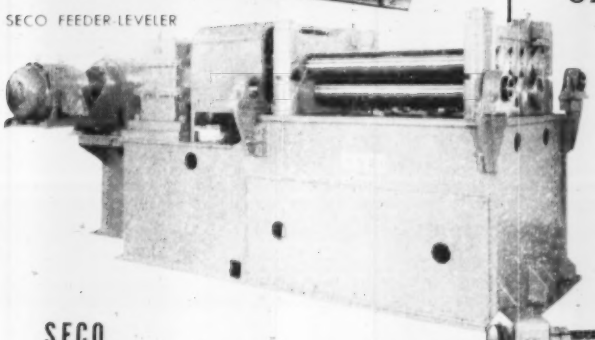


Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

Big, New HEAVY-DUTY SECO 48" SLITTING LINE

SECO PAYOFF REEL

SECO FEEDER-LEVELER

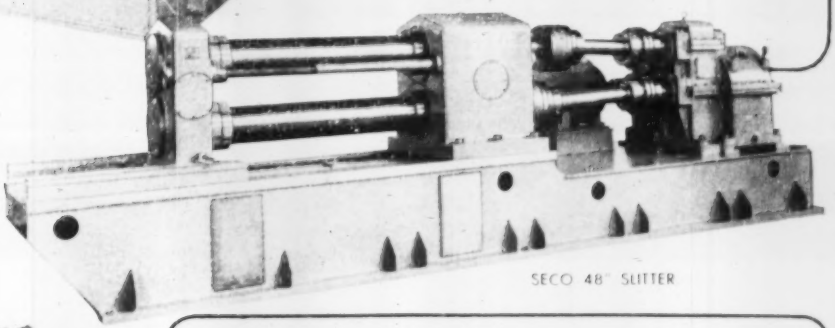


Sets New Standards

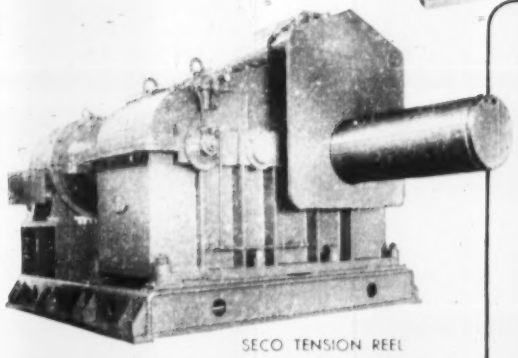
- in Performance and Production
- in Fast, Profitable Operation
- in Safe Handling of Coils Up to 32,000 Pounds

This rugged new SECO Slitting Line handles steel ¼" thick in coils 48" wide, weighing up to 32,000 pounds. The efficient, streamlined SECO Slitter, shown below, makes seven cuts in .250" stainless or low carbon steel at slitting speeds of 100 to 400 feet per minute. This slitter has overrunning clutches for pull-thru slitting. Arbors are 9½" diameter with 16" knives.

SECO SLITTING EQUIPMENT— the latest in design, engineering and efficiency



SECO 48" SLITTER



SECO TENSION REEL

Exceptional quality and accuracy are built into each piece of SECO equipment—assuring efficient, trouble-free, high production.

The Payoff Reel (top left) is of the positioning type, with power feed-up. The Feeder-Leveler is, like other SECO equipment, of the most modern design. The Tension Reel (left) has a 54" long automatic block, 22" in diameter, hydraulic stripper, 250 H.P. motor.

Call or write SECO on your requirements for slitters or other cold-rolled strip mill equipment. We're glad to furnish full information—no obligation. Our years of engineering experience and complete plant facilities are at your service.

SECO

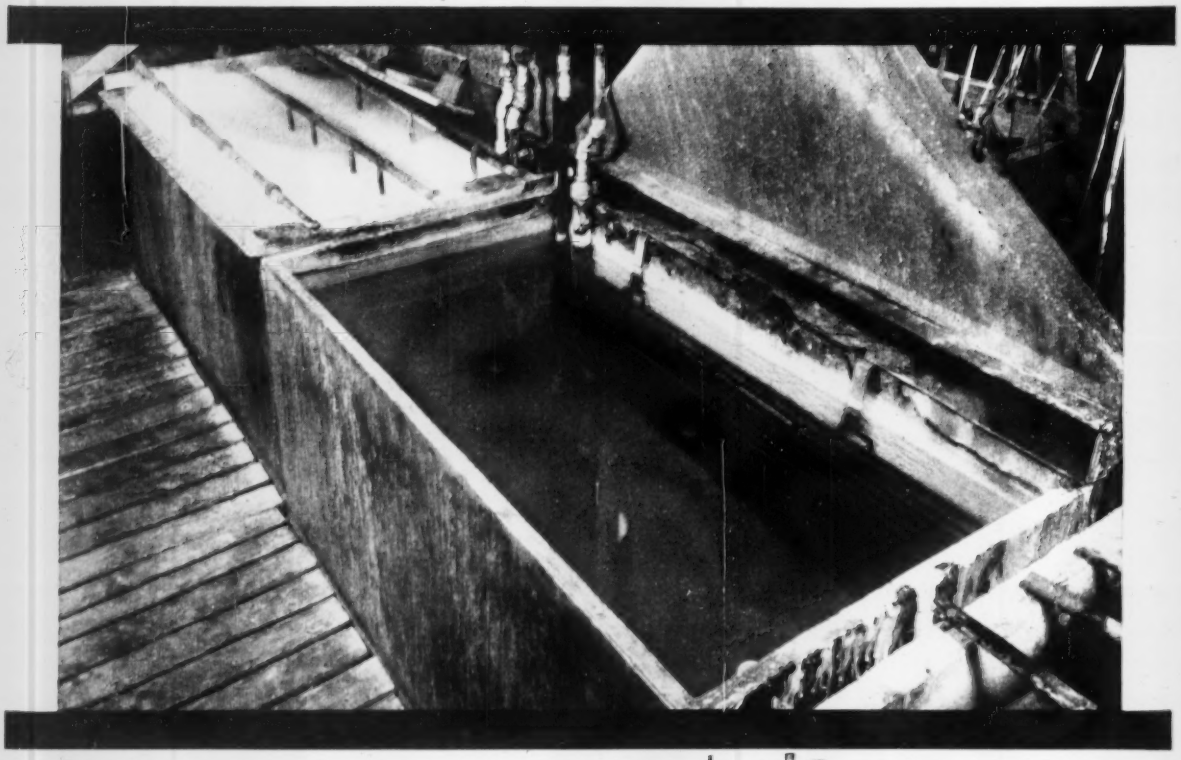
STEEL EQUIPMENT CO.

20805 AURORA ROAD • CLEVELAND 22, OHIO

maintenance costs cut in half as

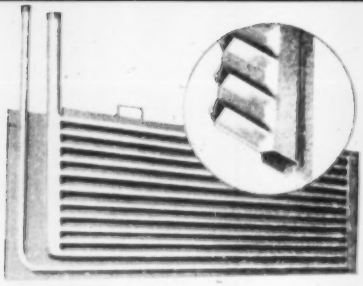
PLATECOILS *cure coil-itis* *

Addressograph - Multigraph Corporation has considerably reduced their process heating costs by changing to Platecoils instead of serpentine pipe coils for such processes as alkaline stripping, alkaline cleaning and chemical blackening of steel. Addressograph saved through lower initial costs, lower installation costs and a 50% reduction in maintenance costs. Much less space is consumed by the Platecoils and heating efficiency is greatly increased.



PLATECOILS *replace pipe coils for 50% of the cost*

* Coil-itis is the constant doctoring of wet processing tanks for pipe coil troubles. It can be cured easily by replacing pipe coils with Platecoils. Immediately, you will notice the difference as Platecoils put new life and profits into your heat transfer processes. They heat or cool 50% faster and take 50% less space in the tank. They save as much as 50% in initial cost and 50% in maintenance costs in addition to overcoming the limitations and operating difficulties of old fashioned and outmoded pipe coils.



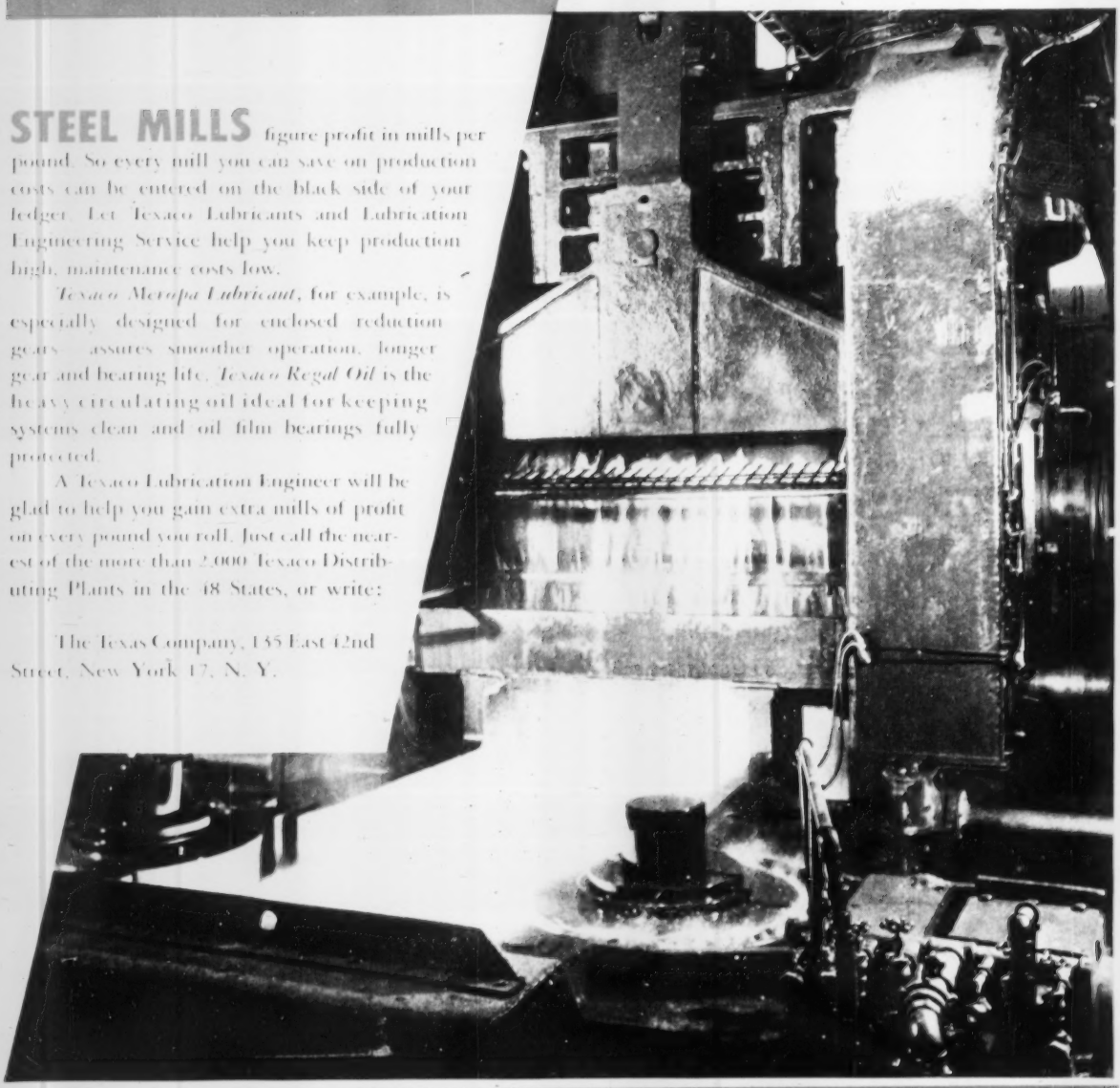
Bulletin P-72 shows how Platecoils are replacing pipe coils at a savings throughout industry. Send today for your copy.

Platecoil Division, TRANTER MANUFACTURING, inc., Lansing 4, Michigan

For fast shipment see your local distributor

Unsurpassed-anywhere!
IT ALL COMES DOWN to one fact . . . that you can always count on Roebling high carbon flat spring steel to reduce preparation time, machine stoppages and rejects to a minimum. What's more, it's made as you want it . . . annealed, hard rolled, untempered, scaleless tempered, tempered and polished, blued or strawed . . .
You *pay* for the best every time you buy flat spring steel. Make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.
ROEBLING
A subsidiary of The Colorado Fuel and Iron Corporation
California giant Sequoias — largest of all trees.
BRANCHES:
PHOTO BY McMANUS

PROFIT IN MILLS



STEEL MILLS figure profit in mills per pound. So every mill you can save on production costs can be entered on the black side of your ledger. Let Texaco Lubricants and Lubrication Engineering Service help you keep production high, maintenance costs low.

Texaco Meropa Lubricant, for example, is especially designed for enclosed reduction gears—assures smoother operation, longer gear and bearing life. *Texaco Regal Oil* is the heavy circulating oil ideal for keeping systems clean and oil film bearings fully protected.

A Texaco Lubrication Engineer will be glad to help you gain extra mills of profit on every pound you roll. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Lubricants, Fuels and Lubrication Engineering Service

TUNE IN . . . METROPOLITAN OPERA radio broadcasts every Saturday afternoon. See newspaper for time and station.

STEEL

April 19, 1954

Metalworking Outlook

Uncle Sam: Machine Tool Buyer

The government's first substantial machine tool buying this fiscal year has been by Carbide & Carbon Co. acting as agent for the Atomic Energy Commission. The Union Carbide & Carbon Corp. subsidiary has just placed about $3 million in orders for use at a classified project. More U.S. business for machine tool builders lies ahead before this fiscal year ends June 30.

Plenty of Galvanized Sheet

There's no truth to the rumors current last week that a sudden stringency in galvanized sheet would lead to a government freeze on that steel product. The U.S. has no authority to take such action even if it wanted to. What led to the rumors is this: Commodity Credit Corp. is in the process of awarding contracts for some 60,000 tons of galvanized sheet to be fabricated into grain storage bins. That's a sizable order, but the industry's capacity for the product is 200,000 tons a month, so there won't be a shortage for other users. Since this job was known to be in the offing, some of the tonnage has already been rolled and set aside.

Beating the Bushes for Business

Some steel companies are sending customers copies of their weekly rolling schedule. If there are openings, customers can make special orders and get unusually fast delivery. It's all part of the industry's drive to get more business and speed up service (p. 96). Although the information on rolling schedules is most commonly given for plate and shape mills, it is not confined to those two products.

A Look Ahead at TV

About $5 billion worth of television sets will be sold within the next three years to some 14 million American families now without TV. So predicts W. C. Johnson, Admiral Corp.'s vice president-sales. He believes "that of the 44 million families living in electrified homes, 95 per cent will have TV within three years." That means that more than 42 million families will have sets compared with today's 28 million, not counting the new families which are being formed at the rate of about 800,000 a year. Replacement demand within the next three years will amount to at least 7 million sets. Mr. Johnson predicts no more than 75,000 color units will be produced in 1954.

Trade with the Reds?

Don't expect any marked easing soon in trade with Iron Curtain countries. Foreign Operations Administrator Harold Stassen has negotiated an agreement whereby Britain, France and the U.S. will assign foreign trade staffs to study the possibility of liberalizing shipments of noamilitary items. Procedural plans should be far enough advanced before the end of April to

The Technical Outlook: p. 135 · The Market Outlook: p. 207

permit discussion of the proposed change with all the NATO countries in a Paris conference. After that, lists of commodities will be gone over to decide what can be shipped. So, it will be months before the exporter can actually trade limitedly with the Communists.

Industrial Fire Loss Mounts

Checked your fire protection lately? Some 25 per cent of all U.S. and Canadian fire losses in 1954 will probably result from industrial conflagrations. National Board of Fire Underwriters reports that industrial fires caused 24 per cent of the $1-billion total fire losses in 1953, 23 per cent in 1952. Damage to industry from fire has been steadily increasing.

Crack-down on Nickel Chiselers

Look for a crackdown on the relatively few sharpies who are operating a gray market in nickel. They are getting most of their metal by misusing the symbols and certifications reserved for defense and AEC programs. Business & Defense Services Administration is investigating four cases. Willful violations will be subject to criminal prosecution.

Big Labor: Big Investor

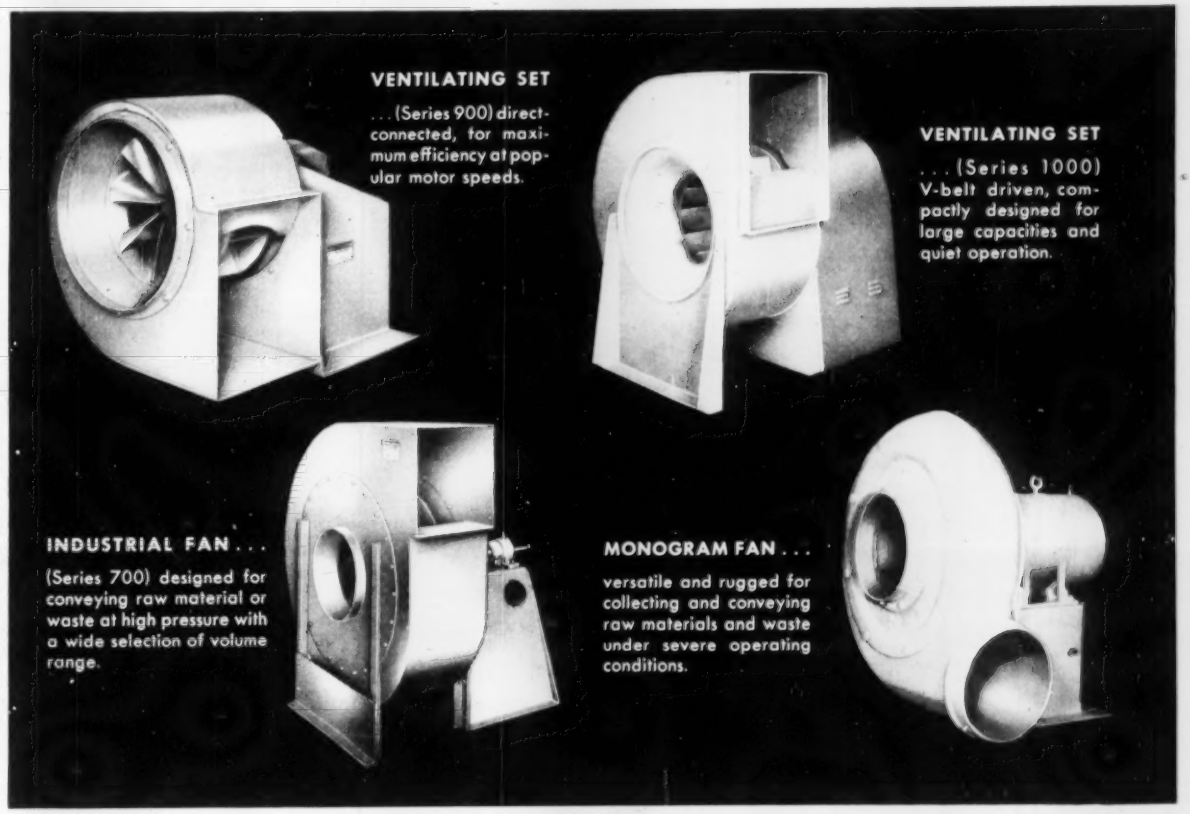
No small factor in current stock market gains is the rapidly rising investment in securities by the rich labor unions. Two years ago unions had less than 2 per cent of their assets invested in the market. It's probably as high as 10 per cent now. Real estate, particularly in Washington, is another home for labor's funds. Dave Beck's teamsters will spend $4 million for their new headquarters in the capital. The machinists have a $2-million structure going up on Connecticut avenue. The AFL has one planned for the city, too.

Straws in the Wind

The business readjustments should be "very largely, if not wholly, behind us" before the end of the year, says National Association of Credit Men . . . The scheme whereby defense work is given to a pool of small companies has flopped, acknowledges Attorney General Herbert Brownell Jr . . . In a few months New York Central Railroad will start to haul truck trailers on flat cars; the road may order 400 75-foot cars for the service . . . A boon to business: The $966 million a year to be spent on federal highway construction in fiscal 1956 and 1957 . . . The Justice department is scrutinizing the whole auto industry for antitrust implications, including the Ford-GM struggle for supremacy . . . Republic Steel Corp.'s first-quarter net income was $11.1 million; net income per dollar of sales was 5.2 cents versus 4.7 cents in the same 1953 period.

This Week in Metalworking

A STEEL survey reveals steel buyers expect to purchase 3.7 per cent more of the metal in May than in March (p. 93) . . . U.S. buying of aircraft will decline, but gradually (p. 95) . . . You're literally walking on steel; 6500 tons of cold-rolled strip are used a year in shoe shanks (p. 97) . . . White Motor Co. produces tailor-made trucks on a mass production basis (p. 98).


VENTILATING SET
. . . (Series 900) direct-connected, for maximum efficiency at popular motor speeds.
VENTILATING SET
. . . (Series 1000) V-belt driven, compactly designed for large capacities and quiet operation.
INDUSTRIAL FAN . . .
(Series 700) designed for conveying raw material or waste at high pressure with a wide selection of volume range.
MONOGRAM FAN . . .
versatile and rugged for collecting and conveying raw materials and waste under severe operating conditions.

These Westinghouse Fans Help You Increase Production...Employee Efficiency

Whatever your air handling problem . . . smoke, fumes, vapor, dust, wood shavings, granular material or ventilating . . . these Westinghouse fans are designed to handle or remove them . . . efficiently and economically.

Monogram and Industrial Fans are designed for collecting and conveying raw materials and waste . . . and permit a wide range of selections to meet the most exacting requirements.

Ventilating Sets are designed for maximum efficiency, quiet operation and low power consumption . . . for years of trouble-free operation.

Each of these rugged, powerful Westinghouse fans will prove to be the most economical solution to your specific air handling problem. And Westinghouse fans offer a *single equipment warranty* with undivided responsibility . . . an *exclusive* Westinghouse-Sturtevant feature. Get the fan built for *your* need from your nearest Westinghouse-Sturtevant office today. Or write: Westinghouse Electric Corporation, Sturtevant Division, Hyde Park, Boston 36, Mass.

SERIES 900 VENTILATING SETS

Compact, efficient, direct-connected and ready-to-run. Especially suited for small ventilating installations. Radial blade wheel design minimizes problem of airborne dirt and grease. Designed for volumes to 3200 cfm.

SERIES 1000 VENTILATING SETS

V-belt driven, self-contained. Adaptable to either indoor or outdoor installations for a wide variety of heating, ventilating or air conditioning applications. Designed for volumes to 14,000 cfm. Available in sizes from 9" to 30" wheel diameters.

INDUSTRIAL FANS (SERIES 700)

Permits a wide range of volume selections at high pressure for handling and conveying raw material and waste.

MONOGRAM FAN

Ruggedly built, many-purpose fans for use either as a blower or exhauster for dust control, collecting and conveying waste or raw materials, and supplying air for furnace blast, drying, etc. Provides long, trouble-free service at low cost under severest operating conditions. Available in ten sizes with capacities from 200 to 13,500 cfm . . . pressures from 1" to 12" wg.

WESTINGHOUSE AIR HANDLING

YOU CAN BE **SURE** . . . IF IT'S Westinghouse

Would new shapes help keep your products ahead?

When your products go on the drawing board for redesign, it may pay you to keep in mind the many advantages of Armco Steel Tubing in special shapes. Tubing is pleasing to the eye. It may be the means of giving your products the extra sales appeal you want.

Chances are good we can supply this welded mechanical tubing in any shape you require. Getting tailored-to-order shapes can help you eliminate or greatly reduce many costly fabricating operations. They help step up production too.

Besides these shop savings, tubular parts give your products the most efficient section for light structural requirements under many types of loading conditions.

RANGE OF STEELS

Armco Tubing is supplied in hot-rolled steel, cold-rolled steel, and Armco ZINCGRIP (steel with a specially applied zinc coating). ALUMINIZED STEEL Tubing is made of a hot dip aluminum-coated steel that resists combinations of heat and corrosion.

Send for catalogs on Armco Steel Mechanical Tubing. A helpful new booklet tells "How to Fabricate Armco Tubing"—gives you all the details you need. Just fill in the handy coupon, attach it to your company letterhead, and mail it today.

ARMCO STEEL CORPORATION

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NAME

COMPANY

STREET

CITY ZONE STATE

The Oppenheimer Case

Last Tuesday the *New York Times* published two important letters. One, dated Dec. 23, 1953, was from Maj. Gen. K. D. Nichols, general manager of the Atomic Energy Commission, to Dr. J. Robert Oppenheimer, one of the nation's most brilliant scientists and the man who is credited with having "built the atom bomb." The letter informed Doctor Oppenheimer that he was suspended from further access to classified information and employment by AEC until such time as certain allegations to his conduct, veracity and loyalty have been disproved.

Among the allegations in the Nichols' letter are that Doctor Oppenheimer associated with many members of the Communist party, contributed money to it and was at one time opposed to the development of the H-bomb. Also several Communist party members are listed who are alleged to have stated that Doctor Oppenheimer also was a member of it.

The second letter in the *Times*, dated Mar. 4, 1954, is Doctor Oppenheimer's reply to General Nichols. It fills 12 columns and it is an amazing story of a confused, preoccupied scientist who associated with dozens of Communistic organizations, contributed to the strike fund of a Bridges' union, got tangled up in the Spanish Loyalist cause, courted one girl who was a Communist and married another who was the widow of a Communist. His brother was a Communist. Doctor Oppenheimer's letter indicates that much of his social life on the University of California campus at Berkeley involved mixing with Communists or Communist sympathizers.

In spite of all of these suspicious connections, associations and activities, Doctor Oppenheimer has been investigated many times over a long period of years and has been cleared. President Eisenhower has appointed a new board of three members to review his case.

Industrial executives would do well to read both letters in the Apr. 13 issue of the *Times*. The letters serve two purposes. First, they reveal an attitude toward Communism that was not unusual among many top-flight scientists during the thirties. Secondly, they indicate how difficult it is to determine whether association with Communists impairs one's ability to do a job satisfactorily and with loyalty to the boss.

E. L. Shaner

EDITOR-IN-CHIEF

THE PATTERN CHANGES: Figures on the distribution of finished steel in 1953 compiled by the American Iron & Steel Institute reflect the effect of a partial transition from a defense to a civilian economy. The "mix" of steel products consumed (pp. 101, 105) was changed slightly in that the percentage of light, flat-rolled products such as strip and sheets in

creased, while that of hot-rolled and cold-finished bars—essential to a defense program—declined. Also the automotive industry—leading steel consumer—in 1953 increased its take of steel.

It is rather interesting to note that three market classifications accounted for practically half of the finished steel shipped in 1953. "Jobbers, dealers and distributors" took 18.56 per cent of the total, the automotive industry 18.30 per cent and "construction and maintenance" 12.38 per cent. The total for these three leaders is 49.24 per cent.

IMPORTANT CUSTOMERS: Beyond these three leaders in the purchase of steel are a number of consumers of special interest. Fourth in percentage of consumption are containers, which for 30 years have been making a strong bid to increase their rank as important customers of the steel industry. In 1953 (pp. 104, 105) they accounted for 7.55 per cent of shipments of finished steel.

Ranking fifth is rail transportation. At one time, probably not more than 35 or 40 years ago, the railroads were the No. 1 customer of the steel industry. They still are important, but in 1953 they consumed only 5.97 per cent of the industry's shipments of finished steel.

Sixth among steel's customers is the classification "machinery, industrial equipment, tools." Last year this consuming group accounted for 5.40 per cent of the shipments of finished steel. If the measure of consumption were computed in dollar value rather than in tonnage, this "machinery, equipment and tool" group would rate higher in the scale of consumption.

A THIRD TO AUTOMOTIVE: Before we dismiss the subject of the distribution of steel, it may be well to look at the figures on alloy and stainless steel which the American Iron & Steel Institute has been developing in recent years. It is important to note that of 5,817,796 net tons of alloy steel, other than stainless (p. 105) shipped in 1953, 1,997,907 tons or 34.3 per cent went to the automotive industry. Another 1,167,425 tons, or 20 per cent went to "machinery, industrial equipment, tools, electrical machinery and equipment."

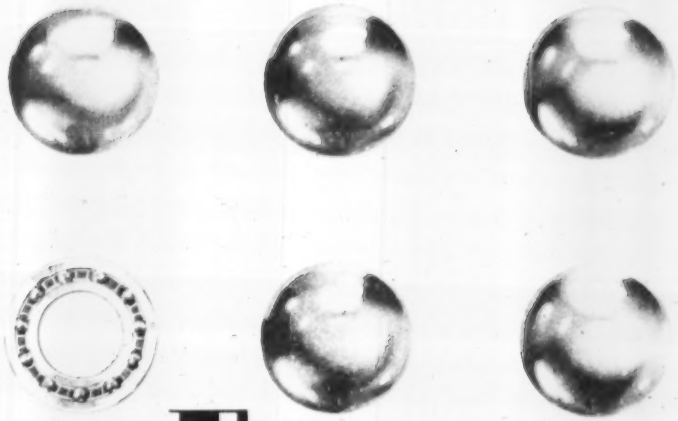
As to the distribution of stainless steel, 25.8 per cent of the 601,708 net tons shipped in 1953 went to warehouse customers and 21.2 per cent went to the automotive industry. The remainder was widely scattered, with "appliances, utensils and cutlery" leading.

NEW ROLE FOR TOOLING: With the annual conference and show of the American Society of Tool Engineers scheduled for Apr. 26-30, in Convention Hall at Philadelphia, the editors of this publication have gone to great lengths to present in this issue (pp. 135-188) not only the highlights of events that will take place in Philadelphia but also a studied appraisal of the new role which tool engineers are destined to play in the development of our manufacturing techniques.

Under the general heading of "Tooling for Competition," the editors develop the theme that the tool engineer is increasingly being called into conferences where his experience is considered before final, top-level decisions are made by management. Also there is presented a check list of items on which careful attention to detail may easily cut tooling costs appreciably. Finally 21 experts express their opinions in a Tool and Die Materials Forum.

OUTLOOK IS FAVORABLE: It is natural that at this stage of the transition from the restrictive influences of winter to the encouraging factors of spring, industrialists almost automatically take a new, fresh view of the business outlook. From the turn of the year to the present day, the prospect has been quite depressing. Employment, while at new high levels, has been off enough to classify from three to four million as unemployed.

This is not alarming when compared with figures from 1933 to 1950. We had more unemployed in 1949 than now, and no labor union leader, "new dealer" or "fair dealer" uttered a single word of protest. Fortunately these are fairly reliable signs that our economic adjustment is progressing favorably and that we are not in for a demoralizing recession. In fact, current news is definitely more encouraging than depressing. Before long, we'll be on the upturn again.



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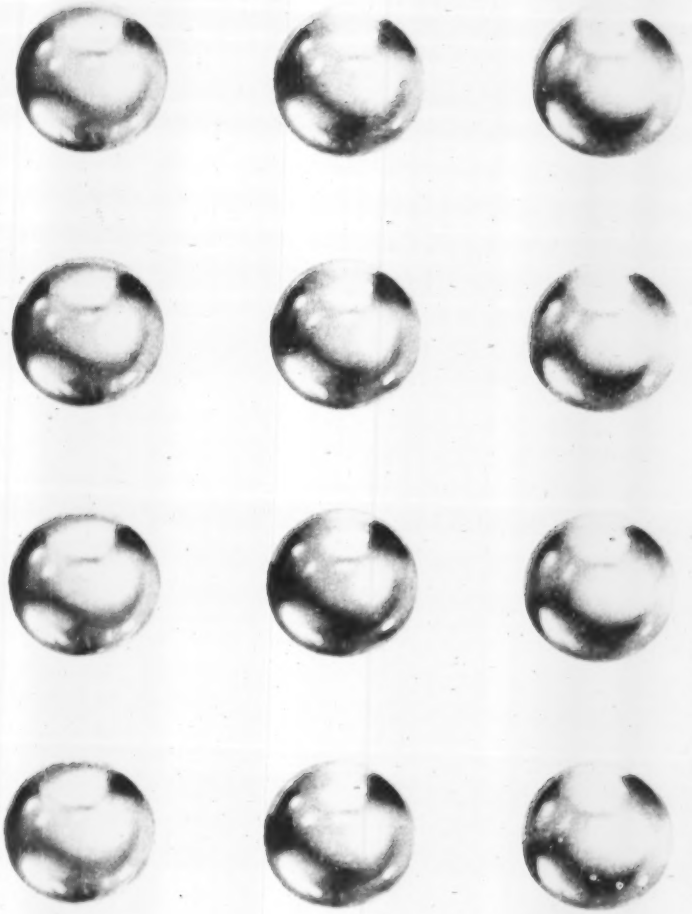

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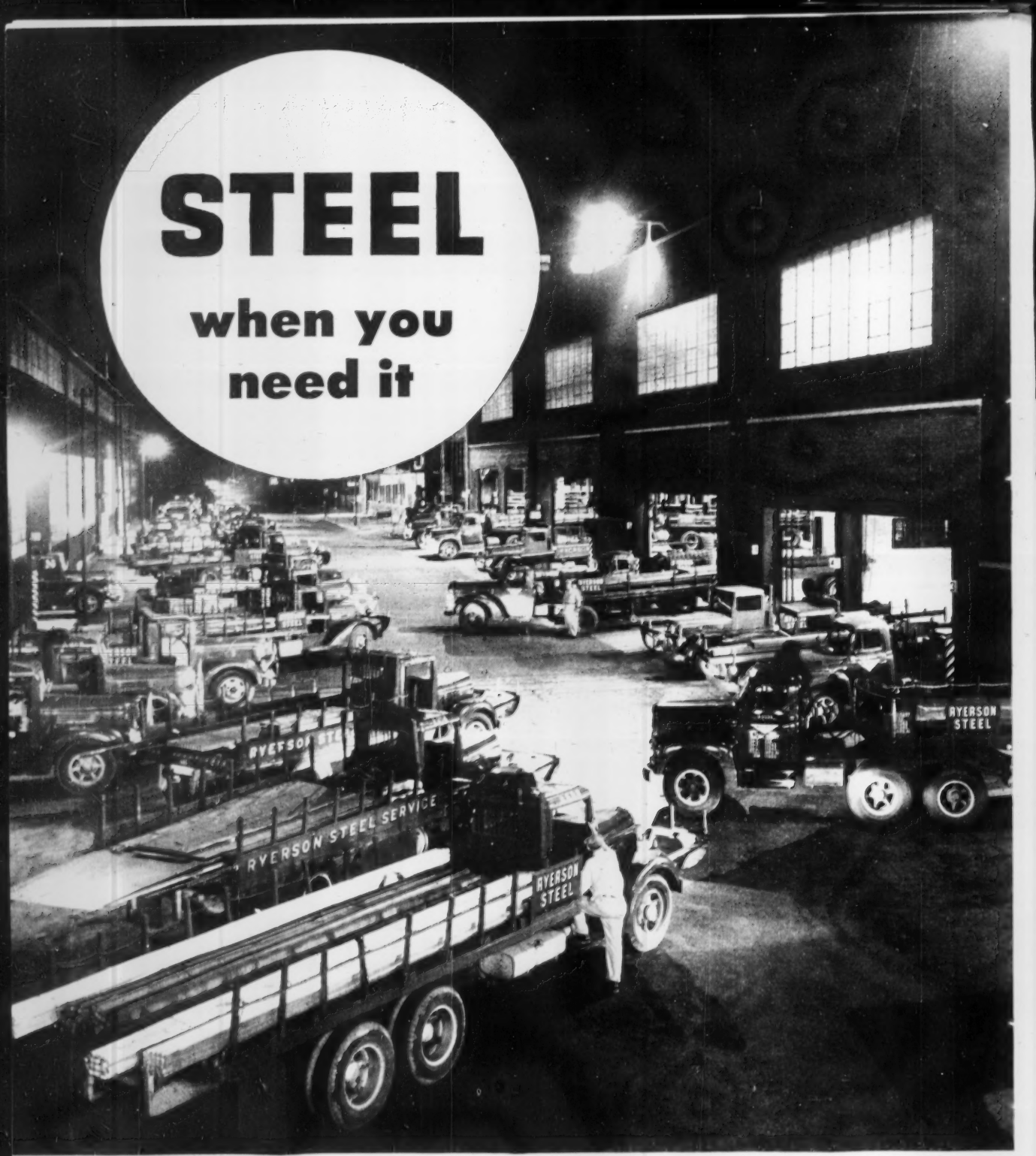

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STEEL BUYING in May: MODEST GAIN over March

A weighted average of purchasing agents' plans reveals they'll buy 3.7 per cent more steel next month than last. That's not sensational, but it's at least an improvement

STEEL SURVEY SHOWS:

46% of buyers expect no change

20% expect to buy less

34% expect to buy more

BUSINESSMEN, often their own best business barometer, foresee a slight upturn in steel buying for May compared with March, 1954.

Using steel buying as the indicator, STEEL has made another of its continuing surveys of metalworking for the answer to the day's most perplexing problem: what kind of business weather lies ahead?

In Thousands of Tons—Responding purchasing agents revealed steel buying on a weighted average will increase 3.7 per cent in May, 1954, over March, 1954. That means instead of the 7,290,000 net tons of ingots and steel for castings as produced in March, steel mills' outturn might be closer to 7,560,000 net tons in May.

Results of STEEL's survey do not herald a sensational shift in business activity; but the weight of the respondents' answers were on the side of cautious optimism.

Who Sees What?—The 20 per cent of the respondents, who foresee a decline in their steel buying, believe the dip will amount to 34 per cent on the average. There were 34 per cent of the respondents who forecast an increase in their buying and who believe the rise will amount to 33 per cent on the average.

Except for buyers of long lead time items, respondents were reluctant to express an opinion of their steel buying prospects beyond May. However, one-third of the respondents said they believe inventories will increase within the next three months. Greatest optimism for larger inventories came from the Midwest; the least amount of optimism regarding inventory increases was found in the South. Without a crystal ball, respondents said they were forced to tack reservations on such predictions. A few indicated steel buying policy would hinge on the drift of labor relations in the steel industry in May. Another handful cited the $1.1 billion slated for Indo-China war aid for fiscal 1955 as the probable determining factor in their steel buying after May.

Quick Reflection—Majority of replies to the survey carried the overtone of extreme caution with words to the effect that "May purchases in large measure will be determined by April sales." This hand-to-mouth steel buying means any rise or fall in business activity will be reflected quickly in the volume of steel purchases.

And as that can be foreseen now, there's a slight lift coming in May.

UAW Union Votes Out Incentives at Willys Plant

THE 10 PER CENT pay cut which Willys Motors Inc. production workers in Toledo, O., were supposed to have voted themselves last week was actually a vote in favor of elimination of an incentive pay plan in favor of a proposed bonus pay plan. The bonus plan payments may make up any present loss in wages to workers.

Ten per cent represents the maximum which can be saved in wage costs by elimination of incentives. About 7000 Willys' workers earn an average weekly pay of $80; top savings could therefore be about $56,000 a week.

Put to Use—The additional capital thus saved will be used for production and engineering changes which will in turn produce surpluses to be paid as bonuses later, it's planned. Such bonuses would be administered by a joint committee of company and union officials yet to be agreed upon.

Production workers, members of Local 12, UAW-CIO, have authorized their committeemen to set up a special committee to study the possibility of a bonus arrangement.

No Indication—There was no immediate indication whether the plan adopted at Willys' Toledo plant will be adopted at other Kaiser Motors Corp. plants, such

as the assembly plant in California, the sport car plant in Michigan, and the stamping plant in Shadyside, O.

Vote in favor of elimination of incentives by union members at the Toledo plant was practically unanimous.

More Hours, Fewer Workers

Wage earners in the steel industry worked more hours per week in February than in January, but there were fewer workers, according to American Iron and Steel Institute.

Weekly average per worker was 37.2 hours in February compared to 35.7 in January and 40.7 in February, 1953. Employment dropped 1.4 per cent to 636,100 from January's 644,900, but employment in the industry of 640,500 for the first two months of the year was higher than the average for any postwar year before 1951.

Average hourly payroll cost to the steel industry for each wage earner in February was $2.299, an increase from January's $2.294 and considerably above the February, 1953, figure of $2.208. With the inclusion of the cost of pensions, social security and insurance on the basis of the 1953 average, the February cost would be about $2.47.

Total payroll estimated for February was $236.5 million compared to $251 million for January.

Westinghouse Sales, Earnings Up

Westinghouse Electric Corp. sales for the first two months of 1954 were 11 per cent above the corresponding period of last year and earnings were also substantially higher, announced Gwilym A. Price, president, at the annual stockholders meeting.

In outlining Westinghouse prospects for 1954, Mr. Price detailed major phases of the planning program including strengthening of the company's sales, marketing and advertising organization; increased production; introduction of new products and elimination of unprofitable lines; extension of research and engineering programs; cost reduction; and management development.

Diversification Planned

Climax Molybdenum Co. looks to alloys and new metals for widening operations

CLIMAX MOLYBDENUM CO., New York, is planning further diversification in the field of alloys and new metals and expansion of its uranium operations on the Colorado plateau.

In announcing the program, Arthur H. Bunker, president, also said that the company has completed its $35-million molybdenum expansion program at Climax, Colo., increasing daily capacity from 15,000 tons of ore to 27,000 tons.

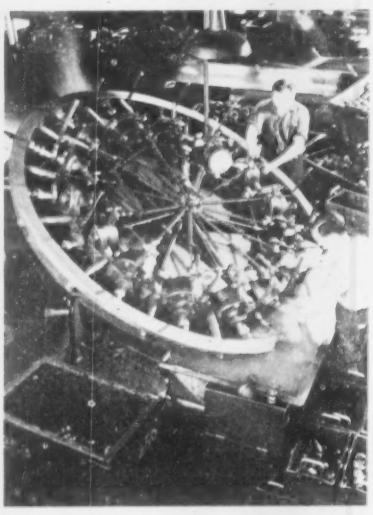
Management Shifts—To carry out the diversification program Carroll L. Wilson, formerly general manager of the Atomic Energy Commission, has been moved from his post of president of Climax Uranium Co., a wholly owned subsidiary, to director of industrial development of the parent company. He will remain a director of Climax Uranium. John H. White Jr. succeeds him as president of the subsidiary.

Climax Molybdenum's production, sales and earnings rose steeply in 1953. In comparison with 1952, production was up 56 per cent, from 23,874,408 pounds of molybdenum to 37,306,341 pounds; sales increased about 40 per cent; and earnings after all taxes and charges rose 60 per cent, from $6,071,519 to $9,717,000.

Thorium, Too—The company's diversification program in 1953 resulted in the acquisition of several thorium prospects in Colorado and the adding of more than $1 million to its net oil and gas investments.

Capacity operations of the company's Climax, Colo., molybdenum facilities is assured by government contract until some time in 1956. A 5000-ton-per-day production from low-grade ores is assured by government contract until mid-1962.

The government's removal last June 30 of all domestic controls on the sale of molybdenum and the lifting of export controls (except for licenses) in January indicate that there is no longer a shortage of the metal.



Dunk Test

Glorified "wagon wheel" is part of equipment used to test unions under water at Crane Co.'s Chicago Works

Kaiser Boosts Foil Production

Kaiser Aluminum & Chemical Corp., Oakland, Calif., expects to boost production of aluminum foil by midsummer to 18 million pounds a year at its Permanente plant. Current production is about 12 million pounds.

New equipment installed in the plant includes a high-speed 60-inch Loewy mill capable of rolling foil to a maximum width of 54 inches at 3000 feet per minute. The Permanente plant has been operating with rehabilitated and modernized mill equipment bought by the government from Germany under the reparations agreement.

New Labor Law for S. Carolina

The "right-to-work" law just signed by the governor of South Carolina is "tough" from the viewpoint of labor union leaders.

In addition to outlawing union membership or the involuntary payment of dues or fees as a condition of employment, the act carries fines and imprisonment for violators and permits injured persons to sue for damages. It also outlaws interference with the right to work by mass or violent picketing. South Carolina is the 16th state to adopt such a law.

Aircraft Output To Slip

U. S. cuts will be gradual as emphasis shifts to quality, development, cost-cutting

AIRCRAFT industry production rates will soon be reduced, but they will be gradual and over a substantial period of time.

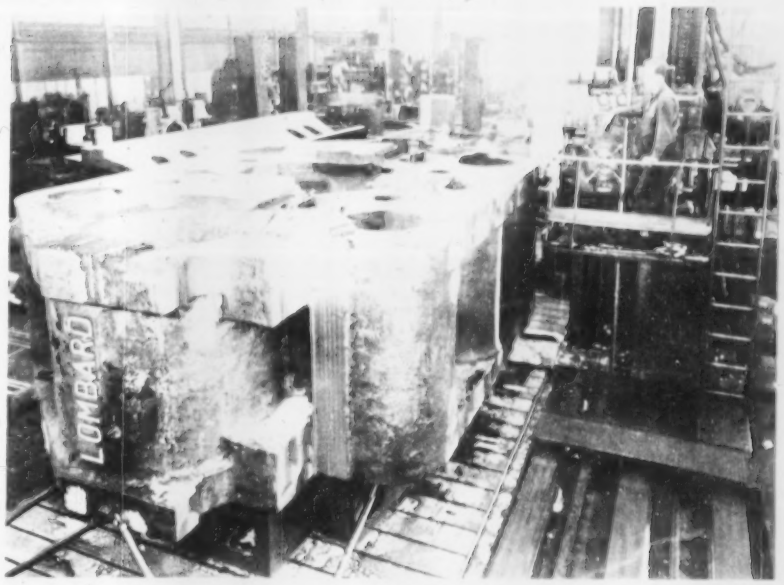
That word comes from Roger Lewis, Assistant Secretary of the Air Force for Materiel. He spoke at the Society of Automotive Engineers Aeronautic Production Forum last week in New York.

New Look—As our air strength now approaches 115 wings, we are entering a period of orderly transition from mobilization rates of production to sustaining and modernization rates of production, said Mr. Lewis. Quality and readiness are now the Air Force's "critical twin objectives" as military forces are tailored to provide security through an "age of peril" rather than to deal with a threat on a specific D-Day, he pointed out.

Describing our present aircraft, engines, accessories and other equipment as probably the best in the world, Mr. Lewis told the engineers it is neither as good as we can make it nor as good as it must be. "We still do not get it soon enough and we still pay too much for it. We do not always have the right tool for the job and what we get does not always work."

No Compromise—The Air Force is reducing number of letter contracts and placing more fixed price contracts to get operations on a more orderly business basis. It will require demonstration of a new product before committing it to quantity production. Compromises against development in favor of production will no longer be necessary.

Industry's part, said Mr. Lewis, is to give as close attention to simplicity and reliability of its product as it gives to quality, and to make certain that when the prime item is delivered the necessary special handling equipment, spare parts, training devices, operating instructions and other supporting elements of the product are delivered at the right time and in the right quantity.



Cylinder Housing Cast for Huge Extrusion Press

Main cylinder housing for a 12,000-ton extrusion press is shown above. The casting weighs about 363,000 lb and was cast at the New Castle, Pa., plant of United Engineering & Foundry Co., Pittsburgh. The press is being designed and built by Lombard Corp., Youngstown, for the Air Force as part of the heavy press program. The installation is to be at Harvey Machine Co. Inc. plant in Torrance, Calif.

Help on the Way for Dealing with Subversives

HELP for employers in dealing with subversives on their payrolls may be forthcoming in a bill being prepared by the Butler subcommittee of the Senate Judiciary Committee.

The bill, being readied with bipartisan support, would force Communist-dominated labor unions to register under the Internal Security Act; permit removal from defense-important industries of employees who might be security risks; effect broader application of sabotage laws; extend the statute of limitations in noncapital offenses; and add various other get-tough provisions for handling Americans of questionable loyalty.

Two Reversals—Need for more teeth in subversive-handling legislation was pointed up by two decisions of the Supreme Court on Apr. 12. In each case the Supreme Court refused to review decisions of lower courts: One held the National Labor Relations Board lacked power to inquire into the truth of non-Communist affidavits filed by officers of the United Electrical, Radio & Machine Workers of America union; the other denied the right of the NLRB to withhold certification of a union that won a bargaining election if an officer of the union is under indictment for filing a false non-Communist affidavit.

The latter case is the International Fur & Leather Workers Unions of the U. S. & Canada, whose president, Ben Gold, was convicted Apr. 2, 1954, of falsification in his affidavit.

Problem and Solution — Guy Farmer, NLRB chairman, has said that employers, who claim the practical necessity of getting along with their unions prevents them from firing subversives, are doing less than their patriotic duty. Yet, Mr. Farmer and other administration officials realize there can be no effective solution to the problem until the federal government obtains powers to deal with it.

That's why the administration is seeking the Butler subcommittee bill to empower the Subversive Activities Control Board to root the Communists out of industry.

HOW YOU CAN PROVIDE QUICKER, MORE EFFICIENT DELIVERY

- Organize a plant committee to determine if order handling can be expedited.
- Telephone or teletype orders wherever possible.
- Acknowledge orders immediately on receipt.
- Send copies of incoming orders to all divisions concerned without delay.
- Allot a time limit for each division to process an order.
- Record time when orders enter and leave each division.
- Analyze filing systems and order procedure for duplication or red tape.
- Make certain customers can obtain from one person all information needed on status of their order, without "going through channels."
- Provide plant managers with clear information on status of each order.
- Determine if new office equipment can speed order processing.
- Build a larger supply of items which can be supplied from stock.

Steel Firms Adapt Retailers' Ideas

The object is to cut down waste motion on order processing and speed deliveries. The added service costs steel companies more, but it pays off in customer relations

"WE'RE PROCESSING ORDERS faster than ever before. We have to to make a sale!" That's how a New York sales executive reacts to new trends in purchasing that are bringing a revolution in order handling techniques at steel companies.

Fabricators with low inventories demand quickest possible delivery. Mills today are rushing to fill orders they would have reluctantly refused last year.

Foresight — Steel management didn't wait until the fire started to buy an extinguisher. While still in a sellers' market more than a year ago, they moved to meet potential demands for speedy order handling. As a result of measures taken then, steelmakers can now offer faster service.

"Need for revision of order handling and processing procedure was realized by Keystone Steel & Wire Co., in 1952," sales officials of the Peoria, Ill., firm report. "After four months' study of inventory controls, filing systems and order procedures, an accelerated system of processing orders was initiated by the industrial sales division in April, 1953."

Close Analysis—"A committee in our company studied every phase of order handling for more than a year, preparing for return to the normal 'buyers market,'" says the vice president of a major Pennsylvania steel producer.

"A task force to speed deliveries is Pittsburgh Steel Co.'s answer to the mounting consumer demand for quick service. There, a committee is streamlining order handling and product flow under supervision of Marvin J. Bair, general manager of sales. The committee analyzes all company operations, beginning at basic steel production points.

Compact closely-knit steel companies can respond to growing demands for quicker delivery with little friction. Great Lakes Steel Corp., Ecorse, Mich., and Sharon Steel Corp., Sharon, Pa., for example, report they can easily handle orders with a minimum of lead time today.

Rapid Service—First step towards quicker handling of orders is speeding answers to inquiries for service. "We use telephone and telegraphic communication between district and home offices much more than we did last year," say salesmen of National Tube Division, U. S. Steel Corp., Pittsburgh.

In receiving orders at Sharon Steel, salesmen transmit a brief copy of the order to Sharon by teletype. Often production has started on that order before a final confirmation is received in Sharon. "Red tape is cut to a minimum. To further serve customers wanting to know status of an order, we offer easy access to our top management," adds R. C. Garlick, assistant vice president, sales.

Quicker Mill Handling—A second step toward smoother order processing lies in new techniques of mill management which help speed orders to completion. At Allegheny Ludlum Steel Corp.'s Watervliet, N. Y., plant, a bulletin board charts progress of each order. Clear information on order

status is available to the plant manager at a glance.

"At Pittsburgh Steel each division has its allotted time to process orders," says Mr. Bair. "Mill schedules are arranged to fill orders when requested, not when it will best suit the mill cycle of operation. Result is more attention to the individual customer's needs."

Paperwork — Third target of campaigns to speed order handling is office procedure. "Quick handling of individual orders was not important last year, when orders were made three or four months in advance," a midwestern sales manager admits. "Now we keep the customer informed of progress of his order all along the line by sending him duplicate copies of various forms. We make notations on each order when it arrives in a certain department and when it leaves. If we find the order moved too slowly, we know where to ask for an explanation."

Steelmakers can fill a growing number of such items as merchant wire products from stock. To the other products they devote as much attention to individual orders as possible.

Pro and Con—Individual attention costs money, of course, and it also leads to some disgruntled millmen. But the advantages of faster service lead to increased business, and that's all-important when the ingot rate is hovering at 70 per cent or less of capacity.

Keystone's industrial sales manager, Ford P. Schusler, says, "Our customers are enthusiastic about quick service." In those seven words, that's why it's here to stay in this steel buyers' market.

Growing Market for Abrasives

The growing popularity in the granite cutting industry of a high-speed wire saw is making that industry a major sales market for abrasives grit manufacturers, according to Richard R. Harvey, manager of abrasive sales for Electro Refractories & Abrasives Corp., Buffalo.

Between five and ten per cent of the silicon carbide produced for abrasive purposes last year was used by granite fabricators, and early 1954 orders indicate the market is expanding.

Steel's in Step

Most of us walk on steel—thanks to the shanks in the instep of our shoes

United Shoe Machinery Corp.

SHANK'S MARE, man's first and still most dependable transportation, consumes approximately 6500 tons of cold-rolled steel strip annually.

Sons of St. Crispin (patron saint of shoemakers), by sticking to their lasts, build into footwear an estimated 540 million steel shanks in close to 270 million pairs of shoes a year. Thus, without realizing the fact, most people are walking on steel.

Spring in Your Step—Functionally, steel shanks support the arch like a bridge, anchored at the heel and spanning the arch. Fitted between the inner and outer sole, the steel shank is the most durable part used in shoemaking. About 17 companies make shoe findings, including these shanks. Metalworking operations involve cutting and shearing, stamping, punching, forming, heat treating and bright finishing.

Most men's shoes are built with steel shanks, accounting for nearly 116 million pairs. Military and service shoes, with special shanks, account for 3.5 million more pairs. The standard military items are uniform, but shanks for civilian footwear include scores of variations flat, oval, fiddler, and ribbed depending on the wood lasts over which the shoes are made. All shoe manufacturers have their own range of lasts, and shanks are formed specifically to those requirements.

Ladies Need Variety — Women buy more shoes than men, nearly 4.0 pairs per capita compared with 1.90 for each man. Total women's footwear production, including slippers, approximated 503.6 million pairs in 1953. Though the ratio of steel-shanked women's shoes to total women's shoe output is smaller than the ratio for men's shoes, the actual number of shanks built into women's shoes is larger. High-heeled shoes require steel shanks, and the elements of style and fashion involve a much larger range of lasts and shanks.

Steel shanks are fabricated of 0.50 carbon cold-rolled strip in widths 0.25 to 1.00 inch when sheared and formed with the grain for length and 3.00 to 6.50 inches wide when sheared across grain for width. The larger volume is made from the narrow widths in progressive operations for punching of tack-holes, stamping, forming, shearing and cutoff. The strip gage most widely used is .057 followed by .050, with rather sharp declines for .040 and .032. The first two of these gages are widely used in production of shanks for women's shoes, with men's and service footwear utilizing .040 gage to a greater extent.

Stepping-It Up—Shank machines are high production units, forming and shearing speeds varying according to design and amount of metalworking required. The average output for the fiddle design is 160 per minute. Most steel shanks are tempered and hardened in conveyor-type salt bath furnaces. The annealing-heating cycle is approximately one hour, including the bright blue finishing operations.

The demand for shank steel in women's shoes parallels female population growth, but demand in men's footwear lags behind the male population growth. Because more men use a car than women, the auto has been blamed for this deplorable situation, but one shoe executive thinks the industry may be making men's shoes that wear too long. Special and more special-purpose shoes for men are needed, he says.

Photographs by Dwight Boyer, *Cleveland Plain Dealer*

Rear view mirrors are installed on the cab assembly line at White's Cleveland truck plant

White Motor Co.—

Where Trucks Are Tailored to Measure

"THE MAN from White Motor is here to measure you for a fleet of trucks."

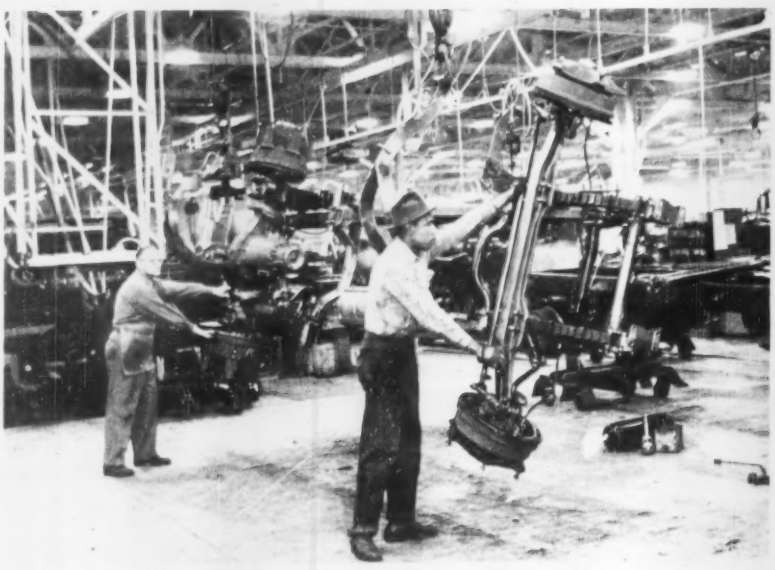
Fanciful perhaps, but not outside the realm of possibility for White Motor Co., Cleveland, which has been tailor-making trucks since the turn of the century.

White trucks are born from a combination of some 60 different models and nine different engines. Each final product has modifications in such components as brakes, axles and transmissions to fit the special work it has to do.

Cut to Measure—The customer who wants a White truck doesn't pick one out on the salesroom floor. Instead he fills out an "application." He tells White the kind of loads, terrain, climate and state regulations the truck will have to contend with. Then White engineers tailor a truck to fit.

Such tactics may sound high-handed, but for White they pay off. In 1953 the company sold 14,973 units for a net sales total of $167,384,914, a record by $17 million over 1951, next best year. As effective counter to a reputation for high prices, White trucks frequently run 125,000 miles without an engine overhaul.

Tip Your Cab—Much of White's success can be laid to imaginative engineering. Obvious example is the White "3000" line with the



Truck chassis is flopped over for engine and cab installation. Transmission, springs, air tanks and piping are installed with chassis in inverted position

tilting cab. In these cab-over-engine trucks the whole cab flips forward to give unhindered access to the engine and front axle.

White developed its tilting cab from ideas and a patent acquired from Sterling Motor Truck Co., Milwaukee, since 1951 Sterling Division of White. During 1953 White continued expansion by purchase of Autocar Co., maker of heavy-duty trucks. White's new Autocar Division will move into a new plant at Exton, Pa., this spring.

Direction of its expansion indicates that White will continue to seek its customers in problem spots like that of the Nashville, Tenn., trucker who needed phenomenally stubby tractors to haul 35-foot trailers in states which impose a 45-foot tractor-trailer limit. White squeezed the tractor length under the limit by tilting the diesel engine 22 degrees, got an order for 140 as a result.

Other sources for the White income include a series of industrial engines introduced in 1952 and a Canadian subsidiary with offices and factory in Montreal. During 1953 the company discontinued its unprofitable motor coach operation, but later this year will bring out a rear engine drive school bus chassis to supplement its present line of conventional school busses.

After test run on dynamometer, engines move to chassis assembly line

Antitrust Speedup

Justice officials hold more consent judgment parleys before filing civil complaints

MORE CONSENT judgment negotiations in antitrust cases are being held before the filing of the civil complaint.

Stanley N. Barnes, assistant attorney general, outlined the procedure before the Antitrust Section of the American Bar Association. By holding informal parleys before the formal proceedings, he aims "to avoid freezing either government or defendants' attitude into publicly expressed positions."

Both Sides Gain—Consent judgments offer several advantages over formal litigation to both defendants and the government, according to Mr. Barnes. For example, judgments entered before trial are exempt from use as prima facie evidence by plaintiffs in treble damage suits. On the other hand, final judgments or decrees rendered in government antitrust actions against the same defendant can be used as prima facie evidence of all issues determined in the earlier decision. By negotiating a consent judgment, defendants also avoid possible unfavorable publicity of a long trial.

On the government's side, "consent judgments spell . . . effective enforcement without the cost of protracted trial." During one sample period, the average litigated case endured some 66.2 months from complaint to entry of final judgment. Consent settlements during the same period averaged only 29.7 months.

Consent judgments are applicable only to civil cases, and requests for them will be denied where the division contemplates criminal proceedings. Prefiling negotiations will also be denied where an important issue of law is involved or where a prolonged delay might weaken the government's position.

Senate Hears Defense Reports

The nation is 122,000 freight cars short of the 1,865,000-car mobilization minimum, Defense Transport Administrator James K. Knudsen told a Senate Appropriations subcommittee. He said there may be a shortage of freight cars this year if there is a large grain crop.

Titanium Process Developed

Union Carbide & Carbon Corp. has developed a new, low-cost method for producing titanium sponge. The firm has been negotiating with the government for a contract to supply 1000 tons of titanium sponge at the current market prices of $1.50 to $5.00 a pound.

Defense Building O.K. Sought

A bill to provide additional construction totaling $896,976,600 at military and Alaska Communication System installations was submitted to Congress by Department of Defense.

The bill includes $110,325,000 for aircraft control and warning systems. Authorization is also requested for facilities required by the 137-wing Air Force.

Projects include construction at 195 continental U. S. installations.

AEC Appointments Announced

Atomic Energy Commission named Alfonso Tammaro as assistant general manager for Research and Industrial Development. He will assist K. D. Nichols, AEC general manager, in programs concerned with reactor development, biology and medicine, research and industrial development. Mr. Tammaro's former post of manager of the Chicago operations office will be filled by John J. Flaherty.

Edward J. Bloch, director of division of construction and supply since 1951, was appointed director of the production division. John A. Derry is now construction and supply director.

Appointments in Washington

Paul E. Gurske, chairman, Oregon State Industrial Accident Commission, has been appointed director, Bureau of Labor Standards.

Thomas P. Pike of Los Angeles has been named assistant secretary of Defense for supply and logistics.

By E. C. KREUTZBERG *Washington Editor*

U.S. Sharpens Services to Labor Surplus Areas, Avoids Handouts

THE U. S. BELIEVES that "the Lord helps them who help themselves," at least when it comes to aiding areas with substantial labor surplus.

No financial handouts are going to the 34 major and 46 smaller localities plagued with serious unemployment. While Washington thinks that capital should be obtained through private channels, it can and does extend aid in other ways.

Just created is an Area Development Division in the Commerce department. It is the focal point and clearing house in the government for distressed areas seeking help.

"The primary mission of the Area Development Division is to work with state and local area development groups and to assist them in their efforts to help themselves," says James C. Worthy, assistant secretary of Commerce for administration.

The Bag of Tricks . . .

What does the ADD have in its bag of tricks? One type of direct assistance is the policy of the Office of Defense Mobilization of allowing extra-liberal percentage of fast amortization for plants within the expansion goals that are located in distressed areas. Unfortunately most of the defense expansion has been arranged so such help cannot be given on a large scale. However, some expansion goals still are open so that, considering that even one plant can help out a lot in a labor surplus community, there are distinct possibilities here. For example, Terre Haute, Ind., recently got such a plant and the economic condition of the city is improved greatly as a result.

A second type of direct assistance is provided by the policy of the armed services in setting aside some of its requirements for procurement from distressed area firms. But this help is not expected to be great because of the Maybank rider which prohibits granting a price differential to a firm in a labor surplus area. That means the firm in the distressed area has to meet the lowest price developed in competitive bidding.

The most valuable assistance, perhaps, is the tendering of information and advice about what new industries would fit the peculiar resources and advantages of the sick community, what new products or processes would help build up backward existing industries and what industry in those communities could do to get more business from expanding markets.

The ADD works with other government agencies, like the Small Business Administration which has power to make loans and render procurement assistance to small business and which is giving special attention to distressed areas. It locates technical and other information about new processes, new products and the like with the help of the Patent Office, Office of Technical Services, Bureau of Standards, etc.

ADD has just completed a "Community Industrial Development Kit" containing valuable reports on the best approaches on the goal of getting more and larger payrolls in a community. It is working on a "New Products Assistance Kit," and a "Market Expansion Kit," both to be crammed with suggestive material under these heads.

Refinements Coming . . .

The work of the new division has only begun. Ways and means of improving its scope and effectiveness are under study. For example, Lothair Teetor, assistant secretary of Commerce for domestic affairs, is asking business advisory committees of the Business & Defense Services Administration to study this problem of distressed areas. He tells them: "You are the jobmakers of America." Coming up soon are conferences in which solution of distressed area problems will be discussed by representatives of communities which have licked their own situations so that the lessons thus learned can be employed by communities currently suffering labor surpluses.

The aid-to-distressed-areas program is under direction of assistant secretary of Commerce Teetor, and his deputy, Carl F. Oechsle. Director of the Area Development Division is Victor Roterus, a Commerce career official.

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Future Brightens for Export Trade

The dollar gap is fast fading so foreign customers with ready cash should become easier to find. Foreign trade in 1953 shows continuing preference for U. S. metal goods

FOREIGN TRADE statistics for 1953 hold a ray of hope for U. S. metalworking companies wishing to expand their foreign markets.

U. S. exports hit an all-time dollar high in 1953 $15.7 billion, thanks mainly to a hefty $3.5 billion in military-aid shipments. But while agricultural exports declined 17 per cent from $3.4 billion in 1952 to $2.8 billion in 1953, nonagricultural exports (other than military-aid shipments) dipped only 3.5 per cent from $9.6 billion in 1952 to $9.3 billion in 1953.

Plus Sales—And among U. S. industries showing gains in 1953 exports were: Refrigerators and freezers, $82 million in 1952, $88 million in 1953; radios and television apparatus, $71 million in 1952, $102 million in 1953; metalworking machinery other than machine tools, $132 million in 1952, $153 million in 1953; tractors and parts, $289 million in 1952, $300 million in 1953; passenger cars, $244 million in 1952, $276 million in 1953; miscellaneous metal manufactures, $342 million in 1952, $343 million in 1953.

These export gains were made in the face of record levels of industrial output and increased pressure to sell in most foreign countries, import restrictions on many U. S. goods and a limited availability of U. S. dollars in many countries.

Gone Gap—The dollar-gap in nonmilitary exports is more than closed, however, points out the American Tariff League. Nonmilitary U. S. exports were $12.2 billion including foreign economic aid in 1953 and general imports were $10.9 billion. But the Commerce department reports U. S. economic grant shipments for January to September, 1953, totaled $1.3 billion, very nearly cancelling out the dollar gap on merchandise trade for the entire year of 1953. And foreign countries earned at least $1 billion on U. S. government spending for military maintenance abroad and have other "invisible" means of dollar income.

As foreign countries continue to build up their dollar credits, it should be easier for U. S. manufacturers to find foreign customers with dollars. Export experience of 1953 shows American-made metalworking products still enjoy a wide customer preference in world markets.

Automotive Exports Climb

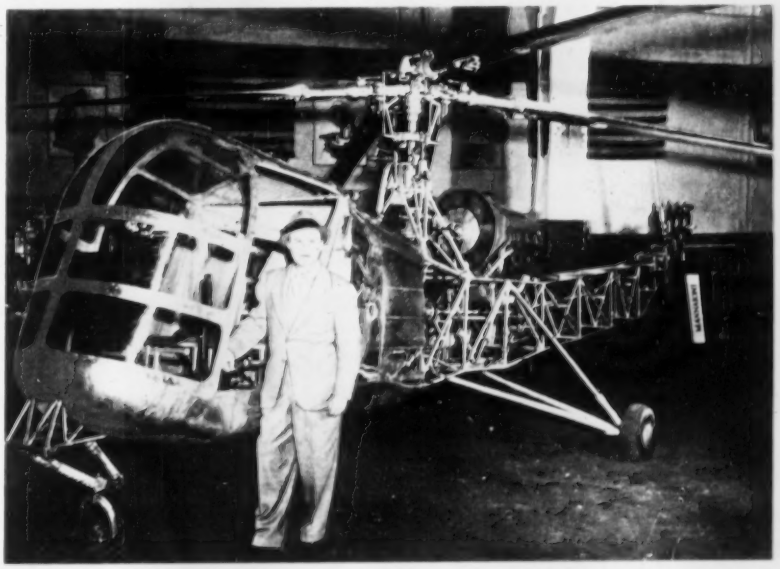
Motor vehicle exports for the first two months of 1954 were more than 10 per cent above exports for the same period of 1953, says the Automobile Manufacturers Association. New vehicles exported in January and February, 1954, totaled 67,497, with February's shipments equaling 6.7 per cent of total output. That's the highest export percentage since March, 1952.

ATL Analyzes Foreign Trade

The American Tariff League's analysis of U. S. foreign trade in 1953 brought out: 1. The ratio of U. S. customs collections to total dutiable imports fell from 12.8 per cent in 1952 to a new all-time low of 12.4 per cent last year. 2. The proportion of duty-free imports to total U. S. imports for consumption declined from 58.2 per cent in 1952 to 54.9 per cent in 1953.

Britain O.K.'s Red Exports

Peter Thorneycroft, president of Britain's Board of Trade, has told the House of Commons that Britain is determined to do all in her power to attain maximum trade with Russia. The Board of Trade has already approved for export $18.2 million out of $35 million in firm orders recently brought home by British businessmen from Russia.



Canadian 'Copter Maker Looks for U.S. Parts Producers

The Canamerican SG-VI, Canada's only commercially-approved helicopter, is being exhibited at the First International Machine Tool Exposition, Brooklyn, N. Y., for the benefit of parts manufacturers, licensees and commercial buyers. Canamerican expects to produce the aircraft in the U.S. and assemble it in Canada with Canadian fuselages. "We're using this unusual method of displaying the helicopter at the Brooklyn show in order to explore every production possibility," says V. H. Abrams, Canamerican vice president. Canamerican expects eventually to license production in other lands as well as Canada and U. S.

Finished Steel: Where It Went in 1953

Return to civilian economy boosts mill shipments to auto industry and increases distribution of light, flat-rolled products

RETURN to a civilian economy is reflected in 1953 steel distribution figures compiled by the American Iron & Steel Institute.

The automotive industry received an increased proportion of the finished steel shipped from mills, and hot-rolled and cold-rolled sheets rose percentagewise while hot-rolled and cold-finished bars declined slightly. The light, flat-rolled products, like sheets, go largely into civilian goods, while bars play a big part in war materiel.

The Lion's Share—In 1953, the automotive industry received 18.30 per cent of the finished steel shipped by mills, compared with 16.00 per cent in 1952 and 16.45 per cent in 1951. Both 1951 and 1952 were Korean war years. In the latter year, distribution was disrupted by a two-month strike of steelworkers.

Indicative of the return to a civilian economy, mill shipments of hot-rolled and cold-rolled sheets comprised 23.7 per cent of the total finished steel moved from mills. The percentage in 1952 was 21. Hot-rolled and cold-finished bars accounted for 14.3 per cent of total mill shipments of finished steel in 1953, compared with 14.7 per cent in 1952.

Big Three—The automotive industry and warehouses were the two largest customers of the steel mills in 1953. In third place was the construction industry. Those three were outlets for half of all of the finished steel shipped by mills that year. The warehouses are distributors rather than consumers,

DISTRIBUTION OF FINISHED STEEL BY

Net tons of mill shipments of all grades, including alloy and stainless

Market Classification	Ingots, Blooms, Billets, Slabs, Sheet Bars, and Seamless Tube Rounds	Skelp	Wire Rods	Structural Shapes (heavy)	Steel Piling	Plates	Standard Rails (over 60 lb)	Rails (all other)	Joint Bars	Tie Plates
Converters, Processors	967,152	26,377	263,538	408		79,940	2,191	546	8,417	239
Forgings (except automotive)	871,929		1,544			17,402				
Bolts, Nuts, Rivets, Screws	26,425		271,756			2,188				
Jobbers, Dealers, Distributors	71,374	1,232	47,361	1,071,006	26,692	1,161,230	7,049	15,769	2,258	1,192
Construction, Maintenance	119,010	18	18,829	2,617,921	282,768	1,789,559	59,012	22,348	2,724	6,242
Contractors' Products	18,375		39,292	17,125		206,634				
Automotive	368,102		38,360	44,990		447,778				
Rail Transportation	25,245		65	453,981	502	1,012,792	1,592,497	9,491	98,941	377,297
Shipbuilding, Marine Equipment	9,121		89	134,867	2,004	576,585	527	326	3	
Aircraft	27,702		53	2,617		11,076				
Oil and Gas Drilling	42,384			40,565	842	94,456				
Mining, Quarrying, Lumbering	2,102		1	33,303	7,935	74,236	44,428	22,865	2,027	7,294
Agricultural	13,814		5,926	46,911		101,714				
Machinery, Industrial Equip., Tools	121,916		71,738	251,258		1,214,302	4,343	3,575	191	171
Electrical Machinery and Equipment	1,988		14,719	38,141		178,303				
Appliances, Utensils, Cutlery	76		1,095	3,205		15,388				
Other Domestic, Commercial Equipment	2,246		15,201	3,792		17,989				
Containers	13,418		932	3,150		45,035				
Ordnance and Other Military	757,141		153	16,578	271	402,578	2,254	53	360	848
Export	51,363	85,770	8,935	241,434	21,880	206,274	154,245	8,276	5,768	32,656
Unclassified	32,858		1,061	760		12,815		4,261	413	6
Total	3,543,741	113,397	800,648	5,022,012	342,894	7,668,274	1,866,546	87,510	121,102	425,945

Market Classification	Mechanical Tubing	Pressure Tubing	Wire, Drawn	Nails and Staples	Wire, Barbed and Twisted	Woven Wire Fence	Bale Ties	Black Plate	Tin and Terne Plate (hot-dipped)	Tin and Terne Plate (electrolytic)
Converters, Processors	11,234	5,277	814,141	565	644	674		5,542		548
Forging (except automotive)										
Bolts, Nuts, Rivets, Screws		3	317,849							
Jobbers, Dealers, Distributors	229,529	104,869	292,074	471,324	122,389	233,359	35,895	71,510	48,673	77,684
Construction, Maintenance	32,076	42,506	58,115	22,002	5,328	7,813	377	7,701	2,525	4,130
Contractors' Products	37,300	17,056	69,589	836		2		19,725	2,345	2,326
Automotive	209,009	10,140	322,423	410				15,261	1,491	5,555
Rail Transportation	4,773	3,717	3,125	3,998	1,120	1,758		18	677	82
Shipbuilding, Marine Equipment	1,448	8,376	674	6	79	6			1	
Aircraft	10,835	380	1,546	40				94	176	24
Oil and Gas Drilling	17,659	2,384	274	33				4	183	
Mining, Quarrying, Lumbering	1,851	391	1,123	295	2	102				
Agricultural	29,168	214	12,471	305	241	76		341	49	609
Machinery, Industrial Equip., Tools	205,564	80,101	246,594	3,885				6,321	4,258	9,748
Electrical Machinery and Equipment	15,600	3,753	60,400	397				8,048	1,895	2,157
Appliances, Utensils, Cutlery	11,950	10,077	47,421	336				69,964	6,610	14,210
Other Domestic, Commercial Equipment	52,562	46	358,070	949				99,953	9,087	9,498
Containers	3,353		104,643	9,760	407		1,658	410,022	895,393	3,033,031
Ordnance and Other Military	102,141	1,771	29,546	1,647	30,739	5	1	371	23,625	1,284
Export	9,236	13,711	36,567	2,550	2,852	1,469	14	34,014	321,092	182,572
Unclassified	104,192	135,903	50,099	9,597						
Total	1,089,480	440,675	2,826,744	528,935	163,801	245,264	37,945	748,889	1,318,080	3,343,458

leaving the automotive industry as the largest steel consumer.

Although 1953 was a record year for mill shipments of finished steel, not all market classifications took as much steel as they did in the strike year of 1952 when production was low. Classifications showing tonnage declines in 1953 from 1952 were: Shipbuilding and marine equipment, oil and gas drilling, agricultural, and export.

The 1953 record of finished steel shipments from mills is 80,151,893 net tons. Previous record was 78,928,950 tons in 1951. Shipments in the strike year of 1952 were 68,003,612 tons. These figures include carbon, stainless and alloy steels.

Although demand for alloy steels softened last year, the total tonnage of finished alloy steel shipped from mills in 1953 rose over the 1951 figure. So did shipments of stainless steels. Biggest consumer of alloy and stainless steels was again the automotive industry.

Where Alloy, Stainless Steel Went

(Mill Shipments in 1953)

	Alloy, other than stainless —net tons—	Stainless —net tons—
Converters, Processors	95,827	31,735
Forgings (except automotive)	591,516	13,904
Bolts, Nuts, Rivets, Screws	81,864	6,876
Jobbers, Dealers, Distributors	469,787	155,436
Construction, Maintenance	101,908	6,365
Contractors' Products	34,826	12,392
Automotive	1,997,907	127,993
Rail Transportation	182,680	6,340
Shipbuilding, Marine Equipment	61,584	3,160
Aircraft	78,404	32,097
Oil and Gas Drilling	165,715	1,982
Mining, Quarrying, Lumbering	23,977	526
Agricultural	40,071	457
Machinery, Industrial Equip., Tools	573,289	19,422
Electrical Machinery and Equipment	594,136	14,571
Appliances, Utensils, Cutlery	36,406	40,656
Other Domestic, Commercial Equipment	32,664	13,875
Containers	24,162	1,538
Ordnance and Other Military	318,839	10,191
Export	126,368	13,134
Unclassified	185,866	69,063
Total	5,817,796	601,708

MARKET CLASSIFICATION DURING 1953

Tables compiled by STEEL from American Iron & Steel Institute figures

Track Spikes	Wheels	Axles	Bars, Hot-Rolled (and light shapes)	Bars, Concrete Reinforcing	Bars, Cold-Finished	Bars, Tool Steel	Standard Pipe	Oil Country Goods	Line Pipe	Market Classification
646	1		231,805	4,494	3,220	324	19,706	11,767	17,713	Converters, Processors
			548,002		5,173	787				Forgings (except automotive)
			559,308		86,664	1,256				Bolts, Nuts, Rivets, Screws
5,696	68		1,502,026	690,222	598,598	19,848	1,980,616	1,442,591	808,454	Jobbers, Dealers, Distributors
2,263	6,468	1,498	651,128	946,906	17,059	132	173,274	18,700	2,271,875	Construction, Maintenance
			217,841	45,593	17,923	82	171,001		19,849	Contractors' Products
			2,545,284		529,152	1,114	4,871		71	Automotive
106,131	308,470	146,747	340,752	2,384	8,248	33	12,826		709	Rail Transportation
	64		66,887	977	3,655	31	15,822		7,229	Shipbuilding, Marine Equipment
			44,411		21,312	790	199		288	Aircraft
			140,216	40	9,270	11	9,800	342,538	32,969	Oil and Gas Drilling
1,228	1,781	261	76,191	2,258	6,011	709	4,550	5	8,520	Mining, Quarrying, Lumbering
			402,903	83	84,005	36	28,486		2,510	Agricultural
195	9,297	1,065	835,570		345,342	14,812	53,945		38,244	Machinery, Industrial Equip., Tools
	194	41	125,318		43,371	377	197,231		10,700	Electrical Machinery and Equipment
			16,164		42,562	154	9,996		150	Appliances, Utensils, Cutlery
			98,089	9	40,833	142	7,689		1,028	Other Domestic, Commercial Equipment
			13,131		211		5,291		1,129	Containers
73	77		646,281		240,682	657	14,051		25,335	Ordnance and Other Military
4,177	5,825	4,598	102,799	73,477	13,052	129	92,466	173,925	160,729	Export
			159,323	82,408	78,032	74,728		29,819	99,816	Unclassified
120,409	332,245	154,210	9,323,429	1,848,851	2,194,375	116,152	2,801,820	2,019,345	3,507,318	Total

Sheets, Hot-Rolled	Sheets, Cold-Rolled	Sheets, Galvanized	Sheets, Coated (all other)	Sheets, Enameling	Sheets and Strip, Electrical	Strip, Hot-Rolled	Strip, Cold-Rolled	Net Total	Per Cent of Total	Market Classification
451,564	110,930	29,488	1,894	851		336,454	105,686	3,513,976	4.38	Converters, Processors
							2	1,444,839	1.80	Forgings (except automotive)
51,295	4,575	292				5,192	14,803	1,341,606	1.67	Bolts, Nuts, Rivets, Screws
1,167,181	1,363,691	845,796	26,901	3,740	14,658	183,178	133,126	14,878,859	18.56	Jobbers, Dealers, Distributors
332,110	132,123	135,243	2,169	764	2	91,532	33,953	9,918,203	12.38	Construction, Maintenance
698,166	711,977	651,685	17,464	39,763	2,495	105,848	193,926	3,324,218	4.15	Contractors' Products
2,733,730	5,681,217	48,477	135,391	2,815	11,342	805,183	701,609	14,663,775	18.30	Automotive
184,254	20,089	28,836	113	786	9,919	21,984	5,470	4,787,830	5.97	Rail Transportation
18,200	10,998	9,870	1,369		163	2,409	423	872,209	1.09	Shipbuilding, Marine Equipment
10,697	14,697	1,999	773	54	1,364	1,618	8,298	161,043	.20	Aircraft
14,120	3,999	1,244			80	1,191	1,452	755,714	.94	Oil and Gas Drilling
13,258	3,074	2,258	21		165	5,412	723	324,380	.41	Mining, Quarrying, Lumbering
173,333	78,659	143,045	5,074	6	65	95,417	7,786	1,233,247	1.54	Agricultural
373,903	154,929	27,865	5,605	325	4,630	130,841	108,071	4,328,604	5.40	Machinery, Industrial Equip., Tools
195,555	260,947	35,829	11,279	6,535	691,863	71,611	135,627	2,111,879	2.64	Electrical Machinery and Equipment
189,699	1,088,194	105,541	23,364	162,590	22,439	23,668	180,896	2,045,749	2.55	Appliances, Utensils, Cutlery
148,123	792,377	62,184	11,470	8,005	6,049	74,572	266,113	2,086,076	2.60	Other Domestic, Commercial Equipment
603,441	540,270	51,057	1,087	146		196,912	117,737	6,051,214	7.55	Containers
167,284	123,560	3,924	643	91	848	27,201	68,815	2,690,888	3.36	Ordnance and Other Military
212,424	178,063	104,764	9,329	2,467	54,014	41,239	25,576	2,679,731	3.34	Export
4,272		1,471					56,019	937,853	1.17	Unclassified
7,742,609	11,274,369	2,290,868	253,946	228,938	820,096	2,221,462	2,166,111	80,151,893	100.00	Total

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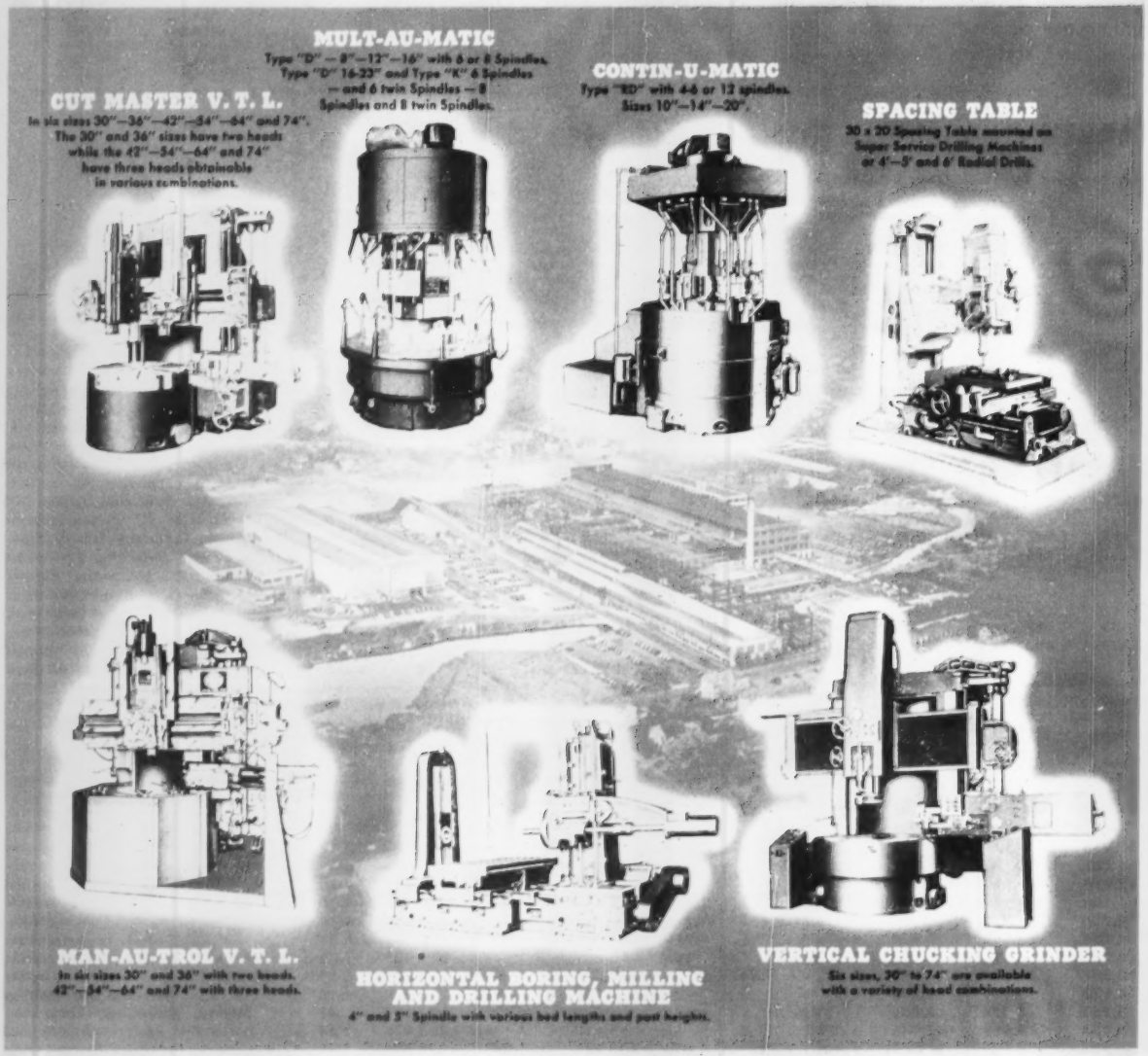
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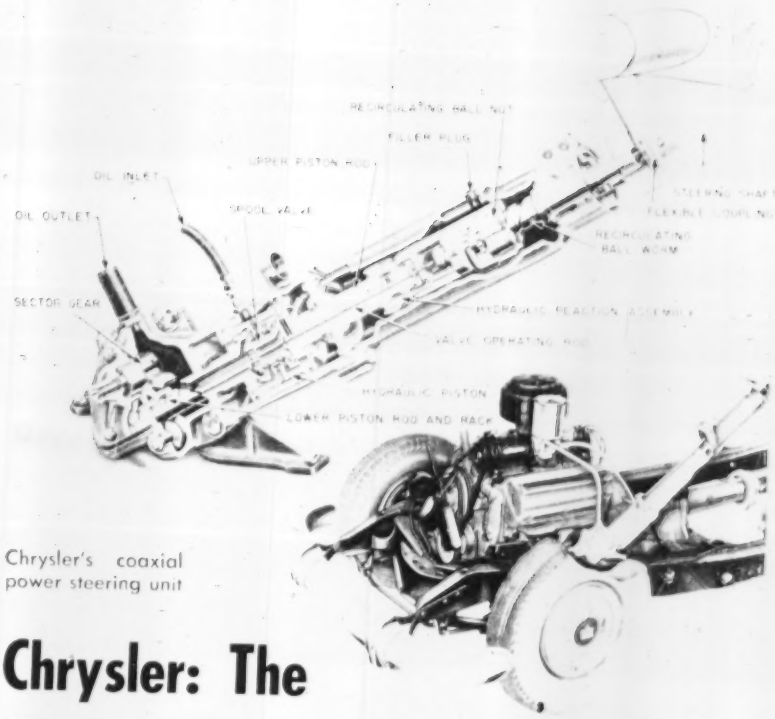

Chrysler's coaxial power steering unit

Chrysler: The Patient Prescribes for Himself

DETROIT

PRUDENTIAL Insurance Co. of America is noted for rocks on its stationery but not in its head. That's why those hanging crepe on Chrysler Corp. as its market share slipped in recent months were hit right between the eyes with a $250-million chunk of the Rock of Gibraltar, the Pru's almost stringless loan to Chrysler.

Problems—The mere fact that Prudential regards Chrysler as worthy of its rock pile is indicative of Chrysler's foundation not being in the sand either. But there is little doubt that Chrysler has some sand in its gears at the moment in the form of an organizational barrier to further growth and greater efficiency.

The origin of the situation goes back to the early days of Chrysler which grew by accretion rather than annexation. Even Dodge, the firm's largest division, was assimilated into the central staff setup rather than continuing as a unit a la General Motors. Efficient at the time, this system began to burst at the seams as the corporation grew larger and for some years now the need for greater divisional authority has been felt.

A Start Made—Real start of the divisionalization program which Chrysler regards as more positive sounding than "decentralization" can be pegged at 1950 when energetic L. L. Colbert became president. Careful study of other corporate structures was undertaken, with the conclusion that Chrysler would have to develop its own structure to suit its special problems. Probable windup will lie between GM's somewhat laissez faire and Ford's less laissez organization. At present about 20 top Chrysler departmental men have been pulled into a full-time group determining the future organizational outlines.

Some steps have already been taken. As of the first of the year, all Chrysler divisions became autonomous units profitwise. That means the central Chrysler accounting staff which formerly told the division how it was doing some months after the horse was stolen itself became divisionalized. Also each division will now sell products it manufactures for other divisions competitively with outside suppliers instead of transferring them as "standard cost" as before. That puts the efficiency burden on each division as buyer and seller and will give each division a picture of its profit and loss right down to the department level.

Thinking Stage—That, coupled with $250 million jingling in its jeans, adds interest as Chrysler takes another look at its manufacturing setup in the divisionalized scheme of things. It's certain that changes will be made. Carl W. Snyder, vice president and operations manager, gives some indicative trends in Chrysler thinking.

Basic to efficiency, of course, is high volume. That means that wherever the same type of part is being made in different plants, consolidation will be considered to get volume up. Just as the Power-Flite transmission plant in Indianapolis now supplies all divisions its production and the Lynch Road plant supplies axles, other unit facilities are under consideration to supplant facilities splitting the volume presently. Other moves of the same type loom probable, not only to eliminate duplicative facilities, but for automation.

Realism on Automation—Chrysler does not have a pollyanna attitude toward automation, but it realizes that where you have a high volume of similar parts the probability of using automation and cutting costs is increased. Thus Plymouth and Dodge hoods, for example, can be designed to go down the same automated press line with only the dies being changed so that the amortization of the handling equipment between presses may be shared.

There are plenty of other parts of which similar planning can be effected to hike volume, but another technique for output boost-

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ing is integration of manufacturing. An example is the new Chrysler full-time coaxial power steering. Announced this week (see photos), the unit will replace Chrysler's currently offered Gemmer integral unit. Being manufactured in Chrysler's Trenton, Mich., plant which also manufactures 6-cylinder Dodge and DeSoto engines, it's a good example of a unit which has grown to sufficient volume to become profitable. Conceivably when production gets rolling, the same unit could be adapted to Dodge and Plymouth cars as well as DeSotos and Chryslers to extend volume further.

Modernization, Too — Other examples of integration include the move to pull large stampings now being made by Budd Co. into the Nine Mile press plant and of course the recent purchase of Briggs Mfg. Co. which builds Plymouth bodies. Briggs, incidentally, is a good example of another area of manufacturing scrutiny: modernizing existing facilities.

Currently under way is a project to dig tunnels under every press line in the Briggs plant to put in a scrap conveyor system. In addition, presses lined up side by side in the plant must be turned back to front to permit in and out automatic handling. That means new pits must be dug and the project is beginning with the major presses first. It will probably be three years before the effort yields a modern, highly automated press plant.

What About Suppliers? — How will the Chrysler program affect suppliers? If you're a vendor of industrial equipment, you'll probably have an opportunity to bid for some of that $250 million as Chrysler revamps its manufacturing operations. If you're a vendor of automotive parts, it might well be wise to re-examine your own manufacturing facilities to be sure you're modern and competitive. Carl Snyder emphasizes that manufacturing integration need bring no fears to the outside supplier who is up to date.

Looking further down the road with Chrysler Corp. it appears probable that before long a parts supplier division will take its place in the new corporate structure.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April		782,453
May		685,390
June		713,206
July		757,595
August		641,152
September		605,228
October		651,153
November		457,852
December		529,588
Total		7,817,783

Week Ended	1954	1953
Mar. 13	143,478	165,762
Mar. 20	154,895	169,923
Mar. 27	149,562	181,749
Apr. 3	146,498	170,567
Apr. 10	152,262	176,783
Apr. 17	150,000*	162,171

Source: Ward's Automotive Reports
*Estimated by STEEL

But whatever course the divisionalization may take, to Prudential and to Chrysler, divisionalization is a new way to "Divide and Conquer."

Car of the Week

Buick might well pick out a slogan like "If you live to be a hundred it'll be a Century." Certainly the car was an appropriate choice for the trip from Detroit to Daytona Beach for Speed Week.

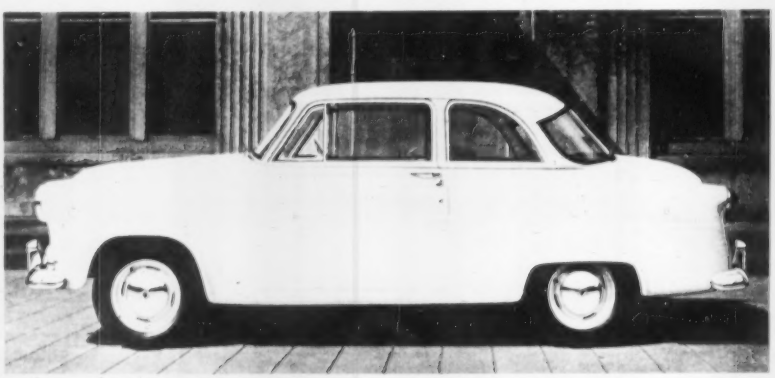
On the trip to Daytona Beach it was no problem to average 50 mph over-all including stops for dinner and gas, for in a Century you don't stay behind anything but police cars.

Just for the heck of it we put the Century through the traps on the beach and with the speedometer hovering at 115 mph turned in a private average of 101.86 mph. That was running with 18 pounds of air in the tires and without touching the engine which had less than 2000 miles on it at that point. The Century, suffice it to say, is a goin' machine, and one entered in the event turned 110 mph.

Perhaps the biggest surprise in the Century was the improved handling over the Roadmaster we drove last year. Ride is still unmistakably Buick with that bubble-gum cushion sensation, but in a corner this car also holds like bubble gum. Roll has been considerably reduced and the braking was noticeably good. This is one bomb that won't go off in your face.

The interior definitely left something to be desired, both in design and in workmanship. Particularly glaring was a jagged point at the end of the dashboard sweep-back and the upholstery looked much like seat covers in fit and appearance. It was a long reach to the radio on the recessed dash and the glove compartment was not only extremely shallow but a long, long reach for the driver.

Oh, yes the windshield didn't crack.



Hudson Brings Out New, Lower-priced Jet

Newest addition to Hudson's line is the two-door Jet Family Club Sedan priced $200 under the previous lowest-priced Hudson. The car has ample room for six despite its compact size, the company says. The new Jet has Hudson's step-down design and Monobilt construction. Dual Range Hydra-Matic drive is optional

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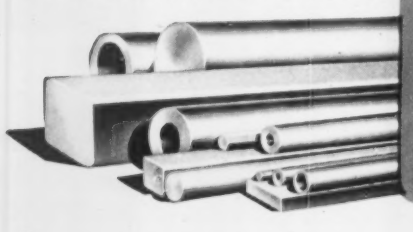
YEARS AHEAD — THROUGH EXPERIENCE AND RESEARCH



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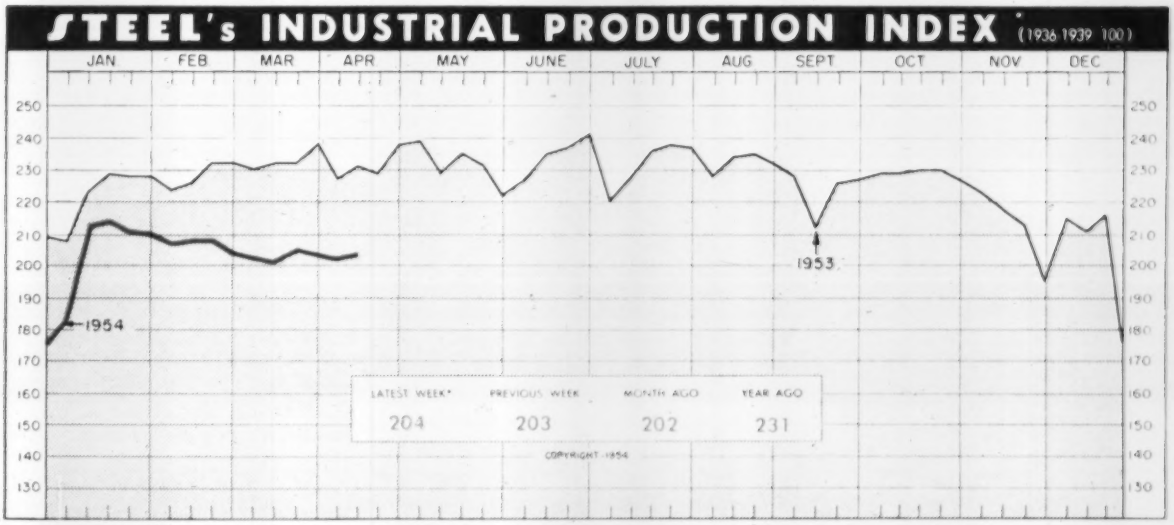


*Week ended Apr. 10

Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automobile Assemblies (Ward's Reports) 20%.

Seasonal Forces Should Spark a Production Upturn

BUSINESS shows signs of improving. This doesn't necessarily mean the economic adjustment is over. Rather, it appears that seasonal forces are lifting business from its current level.

Manufacturers are optimistic. A spot check of 157 companies by the National Industrial Conference Board reveals that four out of ten expect their production in this quarter to exceed first-quarter levels. Contrariwise, only half that number predicts a further decline.

Seasonal forces already have tended to stabilize production. STEEL's industrial production index in March averaged 204 per cent of the 1936-1939 average. During the second week of April, STEEL's index rose 1 point from the preceding week and registered 204 per cent also.

Generating an Upturn . . .

Signs of greater strength are being shown by the components of STEEL's index. Electricity output, generally, has been increasing its over-the-year gains in the last five weeks. During the week ended Feb. 27, electricity output was down to a gain of only 4 per cent above the comparable week in 1953. During the latest week the over-the-year gain had risen to 5.5 per cent, according to the Edison Electric Institute.

Support for the Upturn . . .

Rise in the over-the-year gains in electric output during four of the last five weeks has been aided, generally, by the increased use of electricity in the central industrial district. In the week ended Mar. 6, this section was using 3.4 per cent less electricity than in the comparable week of last year. In the week ended Apr. 3, the over-the-year decrease had been reduced to 1.8 per cent.

More Freight Coming? . . .

The bright spot in railroad freight carloadings is miscellaneous freight, a category which largely includes manufactured goods. During the week ended Apr. 3, the gain in miscellaneous carloadings from the preceding week was greater than seasonal. With a continuance of this impetus, other categories should commence to rise and total carloadings could ascend from the doldrums once again.

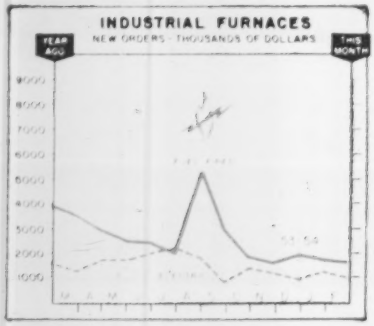
Driving Power . . .

Things are also looking up for the automobile industry. Of special significance is the over-the-year gain in exports during the first two months of the year. In January and February, exports amounted to 6.7 per cent of total output, 10 per cent more than in the comparable period last year.

Auto Sales Have Improved . . .

New car dealers wax enthusiastic over their used car sales in March. During the month used cars moved at the best pace since last July, says *Ward's Automotive Reports*. Accordingly, used car inventories fell 7 per cent below the all-time high established last Nov. 30 to the lowest point since last September. For the first time since last August, used car inventories in the hands of new car dealers are below a month's supply.

Meanwhile, domestic new car sales in March totaled 493,000 units, 23 per cent more than in February and 5 per cent below

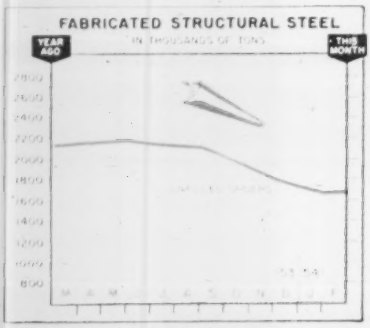


Industrial Furnaces

New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1954	1953	1954	1953
Jan	1,865	3,540	1,374	1,655
Feb	1,758	3,596	1,093	1,672
Mar		3,607		1,301
Apr		3,017		1,796
May		2,606		1,749
June		2,508		2,095
July		2,017		2,246
Aug		1,465		1,904
Sept		1,919		873
Oct		1,975		1,539
Nov		1,692		1,256
Dec		2,013		1,914

*Except for hot rolling steel.
Industrial Furnace Mfrs. Assn.

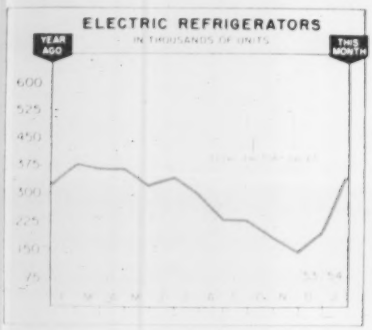


Fabricated Structural Steel

Thousands of Net Tons

	Shipments		Backlogs	
	1954	1953	1954	1953
Jan	242.4	241.4	1,686	2,180
Feb	252.0	251.1	1,697	2,128
Mar		266.3		2,166
Apr		263.2		2,168
May		263.8		2,179
June		274.6		2,153
July		230.3		2,134
Aug		251.1		2,122
Sept		255.6		2,041
Oct		286.5		1,927
Nov		257.8		1,804
Dec		260.9		1,741
Total		3,117.6		

American Institute of Steel Construction

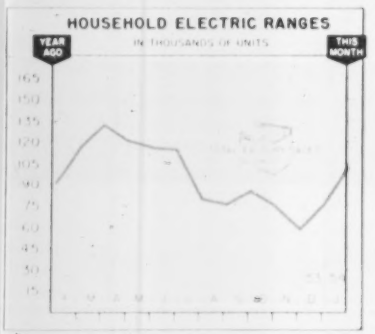


Electric Refrigerators

Total Factory Sales—Units

	1954	1953	1952
Jan	344,101	325,186	260,259
Feb		377,605	259,838
Mar		368,488	276,972
Apr		366,951	225,994
May		317,667	217,917
June		343,114	324,855
July		298,838	333,877
Aug		232,981	250,224
Sept		231,224	230,111
Oct		179,749	207,065
Nov		139,563	256,530
Dec		197,102	248,506
Total		3,378,478	3,091,434

National Electrical Mfrs. Assn.



Household Electric Ranges

Total Factory Sales—Units

	1954	1953	1952
Jan	101,870	88,145	79,982
Feb		114,465	63,063
Mar		130,788	93,225
Apr		118,999	69,149
May		114,404	68,117
June		113,086	86,847
July		77,836	83,467
Aug		74,326	74,853
Sept		84,481	62,404
Oct		73,422	63,143
Nov		56,748	72,982
Dec		73,870	84,630
Total		1,119,570	901,860

National Electrical Mfrs. Assn.

Charts Copyright 1954 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Feb 22	Indus. Production	Mar 29	Ranges, Gas	Mar 22
Durable Goods	Mar 22	Ironers	Apr 12	Steel Castings	Mar 15
Employ., Metalwk.	Apr 5	Machine Tools	Mar 8	Steel Forgings	Mar 8
Employ.* Steel	Mar 8	Malleable Castings	Mar 15	Steel Shipments	Apr 12
Foundry Equip.	Apr 5	Prices, Consumer	Mar 22	Vacuum Cleaners	Apr 5
Freight Cars	Feb 22	Prices, Wholesale	Apr 5	Wages, Metalwk.	Mar 1
Gears	Apr 12	Pumps	Mar 15	Washers	Apr 12
Gray Iron Castings	Mar 15	Radio, TV	Mar 29	Water Heaters	Mar 22

March, 1953. The selling rate during the last ten days in the month—20,000 cars daily—was at a seven-month peak. However, new car sales were not great enough to retard inventories, which still remain above the 600,000 level. And unless sales improve further, the industry's scheduled April production of 500,000 cars will cause stocks to rise even higher.

Better Month than Expected . . .

The latest Office of Business Economics data—on total sales and inventories in February—points up the generally healthy condition of the economy. On a seasonally adjusted basis, sales during February totaled $46,597-million, a gain of $133 million from the preceding month. Though manufacturing sales slipped, both wholesale and retail sales were greater than in January.

Inventory Cut Continues . . .

Inventory continued to be cut during February. Stocks were reduced $352 million to seasonally adjusted grand total of $80,340-million. Reductions were made in both the manufacturing and retail sections. The wholesale area increased its inventories.

Latest Unemployment Picture . . .

The unemployment situation, on the basis of March figures, is also getting better. Secretary of Labor James P. Mitchell says that both the average number of new claims for unemployment compensation and the number of unemployed insured declined during the month. The former dropped by 20,000 and the latter by 80,000.

Buying Power Props . . .

Unemployment insurance is one of several factors that have kept the economy from declining more rapidly in recent months. Another, not as prominently mentioned, but of considerable importance also, is the relationship between sliding production and employment. In many industries, production can be cut much quicker than employment. Net result is that purchasing power is kept up while an economic adjustment is being made.

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,626	1,648	2,230
Electric Power Distributed (million kwhr)	8,396	8,463	8,001
Bitum. Coal Output (daily av.—1000 tons)	987	1,112	1,189
Petroleum Production (daily av.—1000 bbls)	6,450[1]	6,486	6,268
Construction Volume (ENR—millions)	$314.3	$329.5	$342.0
Automobile, Truck Output (Ward's—units)	152,262	146,198	176,783
TRADE			
Freight Car Loadings (unit—1000 cars)	605[1]	599	721
Business Failures (Dun & Bradstreet, no.)	216	267	140
Currency in Circulation (millions)[3]	$29,795	$29,701	$29,780
Dept. Store Sales (changes from year ago)[4]	13%	11%	8%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,703	$17,894	$15,708
Federal Gross Debt (billions)	$270.3	$274.9	$264.5
Bond Volume, NYSE (millions)	$17.2	$15.7	$20.9
Stocks Sales, NYSE (thousands of shares)	10,330	10,785	10,278
Loans and Investments (billions)[4]	$78.1	$79.2	$76.8
U. S. Gov't Obligations Held (billions)[4]	$30.9	$31.6	$29.5
PRICES			
STEEL's Finished Steel Price Index[5]	189.71	189.71	181.31
STEEL's Nonferrous Metal Price Index[6]	211.9	212.5	229.3
All Commodities[7]	110.9	110.9	109.4
Commodities Other Than Farm & Foods[7]	114.6	114.4	113.2

[1]Dates on request. [2]Preliminary. [3]Weekly capacities, net tons: 1954, 2,384,540; 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939 = 100. [6]1936-1939 = 100. [7]Bureau of Labor Statistics Index, 1947-1949 = 100.

Profits, of course, suffer during the process.

Separate Entities . . .

In the prelude to its survey of business conditions the National Industrial Conference Board notes that the extent and severity of the current decline varies widely from industry to industry and even among producers in the same industry. Current statements and reports, even from concerns in the same industry, reveal the same fact. Thus in the latest fiscal quarter or month one company says that sales are above the year ago period, while another states that it is cutting employment or taking an extended inventory. A third concern may report reduced sales yet increased earnings. So it goes in this period of ever-increasing competition.

Volume Economics . . .

Greater competition has also focused the spotlight more sharply on earnings per dollar of sales. These earnings have been declining for at least several years. They declined last year, generally, but the high volume of sales kept total earnings up. Now the high volume is diminishing and competition is forcing a continuation of the same trend. Net result is a cut in profits for many concerns. For others it means going out of business before disaster takes over. Thus the National Automobile Dealers Association reports that 587 new car dealers went out of business during the first quarter, 205 more than in the comparable period of last year.

Business Prepares . . .

The business decline and the tendency to put one's house in the best order possible is also responsible for the sharp fall in loans to business. From the first of the year to Apr. 7, business loans made by major New York City banks have fallen $404 million.

Consumer Prepares Also . . .

The American consumer has also retrenched even though it appears that he could easily spend more. That opinion of Arno J. Thompson, vice president and economist of the J. Walter Thompson Co., is backed up by figures which show that personal income after taxes during the first quarter was at an annual rate of $250.5 billion, $5.9 billion more than the like quarter last year.

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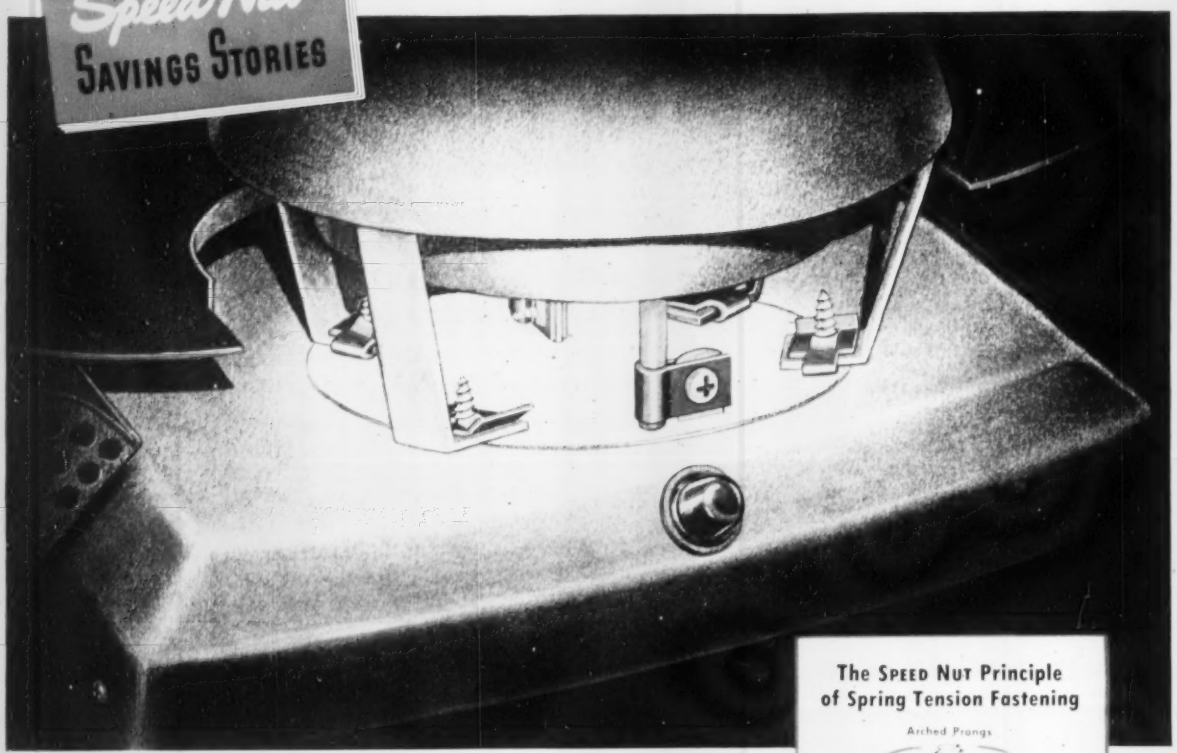

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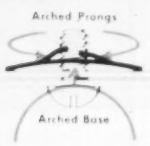
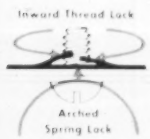


PRE-LOCKED POSITION



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. . . Niles-Bement-Pond president

J. M. BRASHEAR
. . . Lone Star Steel gen. supt.

ROBERT E. HARVEY
to direct Newport Steel operations

Alexander H. d'Arcambal was elected president of **Niles-Bement-Pond Co.**, West Hartford, Conn. He succeeds **Charles W. Deeds**, elected chairman of the board. **Richard W. Banfield** was named to the newly created position of executive vice president. Mr. d'Arcambal has been acting general manager since the death of **Frederick U. Conard** on Mar. 14.

Wilmer H. Churchill and **Arvid H. Corneliussen** were elected vice presidents of **United-Carr Fastener Corp.**, Cambridge, Mass. They continue in their respective positions of chief product engineer and sales manager.

Edward A. Livingstone, vice president, **Babcock & Wilcox Co.**, New York, was elected to the board of directors. He also was placed in charge of the company's tubular products division. He assumes the position vacated by **Luke E. Sawyer**, who became a consultant to the company handling assignments in the tubular products division.

Todd W. Fredericks was appointed Detroit district manager of the original equipment division of **Aluminum Industries Inc.**, Cincinnati. He has served for 20 years as representative of the automotive division of Bohn Aluminum & Brass Corp., Detroit.

Promotions at **Lone Star Steel Co.**, Lone Star, Tex., include: **J. M. Brashear**, former open-hearth furnace superintendent, made general superintendent; **L. G. Graper**, vice president-research and development, named to assume duties formerly held by **W. R. Bond**, vice president-operations, who has resigned; **A. J. Malone**, made assistant general superintendent, steel division; **Glenn Anderson**, assistant general superintendent, coke-iron-ore division; **Steve Purcell**, superintendent, open-hearth furnace department; and **McCready Young**, superintendent, production planning department.

Bliss & Laughlin Inc. appointed **Harry M. Clarke** manager of a newly formed department of commercial research which has headquarters in the company's general offices at Harvey, Ill.

Robert S. Grover was elected executive vice president, **Apex Steel Corp.**, Los Angeles.

Helmer Peterson was named plant superintendent of **A. P. Smith Mfg. Co.**, East Orange, N. J.

Albert H. Barrett was made director of purchases for **Taylor Instrument Cos.**, Rochester, N. Y. Formerly production manager, he succeeds **Curtis D. Hart**, retired. **John B. Ireland** succeeds Mr. Barrett.

Robert E. Harvey was elected executive vice president and general manager of **Newport Steel Corp.**, Newport, Ky., subsidiary of Merritt-Chapman & Scott Corp. He most recently served as vice president and comptroller of Capital Transit Co., Washington. **Rolland O. Baum**, vice president of Merritt-Chapman & Scott in charge of procurement, subcontracts and insurance, was made a Newport Steel vice president, and **D. M. Pope** was appointed comptroller.

Pittsburgh Steel Co. appointed **Robert A. Crawford** superintendent of its hot sheet mill at Allenport, Pa. **Anthony Thomas** was made head roller.

Seymour Weinstein was made technical director of **Niagara Filters Division**, American Machine & Metals Inc., East Moline, Ill. He formerly was in Chicago as central district sales manager. **J. Walter Bird** takes over in that area.

Wheeling Corrugating Co., Wheeling, W. Va., appointed **J. A. Lane** assistant to the vice president and **A. F. Stewart** manager of market research and sales analysis division.

T. V. Learson, general sales manager, **International Business Machines Corp.**, New York, was made director-electronic data processing machines. He will co-ordinate en-

GEORGE BACKMAN

HARRY LANGE

appointments at Waterbury Farrel Foundry & Machine

gineering, manufacturing and sales activity.

Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., appointed **George Backman** manager and chief engineer of its rolling mill and mill machinery division to succeed **Irving H. Tolles**, retired from the position of manager. **Harry Lange** was promoted from assistant chief engineer to chief engineer in charge of the bolt, nut, screw and rivet machinery division, a position formerly held by **Joseph M. Schaeffer**, recently elevated to company president.

Chalmers B. Coleman was named plant superintendent of **Melco Wire Products**, Los Angeles.

Harry M. Heckathorn, vice president, was elected president of **Mullins Mfg. Corp.**, Salem, O. He succeeds **George E. Whitlock** who was named to fill a newly created position of vice chairman. **Harry Krohne** was elected vice president, continuing as controller and secretary. **Frank W. Knecht Jr.** was made vice president of administrative planning and assistant secretary. **Harold O. Smith**, general manager of operations, was named vice president in charge of operations to succeed **Frank M. Beauregard**, who will serve as special consultant to the president. **C. D. Alderman**, vice president in charge of merchandising, becomes vice president in charge of sales and

Charles A. Morrow, a vice president, becomes a special consultant to the president and vice chairman.

Pfaudler Co., Rochester, N. Y., placed **Sidney W. McCann** in charge of manufacturing activities as manager of the Rochester division. **Howard W. Zoller** becomes factory manager and **A. V. Osborne** chief engineer.

At **Chrysler Corp.'s** jet engine plant near Utica, Mich., **W. W. Beadle** was appointed superintendent of production and **E. J. Weiss** plant engineer. Mr. Beadle has been serving as superintendent of assembly at the plant and Mr. Weiss has been assistant plant engineer.

Clearing Machine Corp. transferred **Geroge Herrick** from its Lansing, Mich., to the Detroit sales office.

Thomas J. Gerwig was appointed an assistant district sales manager in **Republic Steel Corp.'s** Chicago district. He is succeeded as district sales manager, Philadelphia, by **Theodore M. Gloeckner.**

Norman F. Gebauer, field salesman in St. Louis, was appointed director of a newly formed industrial sales district, industrial division, **Keystone Steel & Wire Co.**, Peoria, Ill.

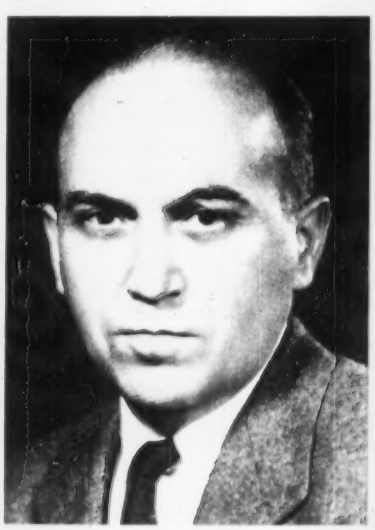
Earl F. Warner was appointed works manager of the El Segundo, Calif., plant of **Nash Motors Division**, Nash-Kelvinator Corp. Former works manager, **Campbell Wood**, is relinquishing the post to take a leave of absence.

Ralph M. Lehman was appointed assistant sales manager, **Ross Gear & Tool Co.**, Lafayette, Ind.

Carroll N. Lowe was elected vice president-sales and a director of **Sargent & Greenleaf Inc.**, Rochester, N. Y.

J. G. Gerrard succeeds **R. H. Herner**, resigned, as supervisor, commercial products service, transmissions operations at the Allison Di-

W. W. BEADLE



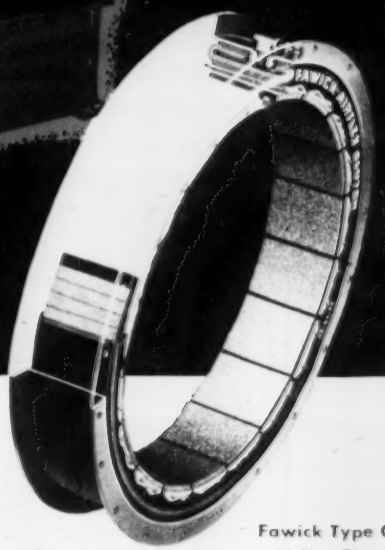
E. J. WEISS

appointments at Chrysler's jet engine plant

TYPICAL EXAMPLES OF FAWICK APPLICATIONS ON MODERN PROCESSING MACHINES

STAMCO Coil Box, coil opener, and feeding unit equipped with FAWICK Type CB Airflex Clutch with ventilating adapter.

FAWICK...
CONTRIBUTOR TO PRODUCTIVITY



Fawick Type CB Airflex Clutch

Here is another clutch installation that demonstrates why there is an ever-increasing demand for FAWICK Airflex Clutches.

It is used on a machine produced by STAMCO, Inc. called a Coil Box, coil opener, and feeding unit.

Operation of this unusual machine requires exceptionally high clutch performance. The rolls operate in either direction, with "inching" speeds ranging from 50 to 150 feet per minute. The clutch must also operate at free-wheeling speeds up to 500 feet per minute.

FAWICK'S simple design and sturdy construction provide operating accuracy, complete inching control, low maintenance, and long, adjustment-free service life.

If your problem involves industrial clutches, FAWICK engineers will be glad to show you the many advantages FAWICK units will provide for your specific machines. Simply call or write the Main Office, Cleveland, Ohio.

FAWICK AIRFLEX DIVISION
FEDERAL FAWICK CORPORATION
9919 CLINTON ROAD • CLEVELAND 11, OHIO

For further information on Fawick Industrial Clutch and Brake Units, write to the Main Office, Cleveland, Ohio for Bulletin 400-A.

FAWICK Airflex
INDUSTRIAL CLUTCHES AND BRAKES

EDWIN C. McCLEARY
Willys-Motors v. p.-manufacturing

M. W. ZOLTON
joins York-Gillespie Mfg.

A. A. ARCHIBALD
. . . v. p.-special products at J&L

vision of **General Motors Corp.**, Indianapolis.

Edwin C. McCleary was appointed vice president in charge of manufacturing for **Willys Motors Inc.**, Toledo, O. He will direct all phases of manufacturing at the Toledo main plant and at the Maywood, Calif., assembly plant. Mr. McCleary joined Willys in 1948 as production manager and has recently served as assistant to the executive vice president.

New Plastic Corp., Los Angeles, elected **J. Allen Carmien** president, **W. C. Fortier** vice president-treasurer. Mr. Carmien, formerly executive vice president, acquired controlling stock interests and will direct company policy in the future. **Fred S. Jahn** resigned as president.

Julian C. Pease, vice president, was made executive vice president, **New Britain Machine Co.**, New Britain, Conn. He continues as general manager of the New Britain-Gridley Machine Division.

A. E. Nussbaum was made engineering consultant by the rolling mill division of **Stanat Mfg. Co.**, Long Island City, N. Y.

M. W. Zolton was appointed general manager in charge of the manufacturing and engineering facilities of **York-Gillespie Mfg. Co.**, Pittsburgh. With 18 years' experience in production and management in heavy industry, Mr. Zolton leaves Barium Steel Co. where he served as manager of its special products division at Pelham, N. Y.

Barium Steel Corp., New York, announces changes in executive positions at its subsidiaries, **Phoenix Iron & Steel Co.** and **Phoenix Bridge Co. Harold B. Freeman Jr.**, formerly director of purchases of Phoenix Iron & Steel, was elected a vice president. **William A. Cook** was elected treasurer of both companies in addition to his present responsibility as vice president of both. In addition Mr. Cook is vice president of Central Iron & Steel Co., another affiliate of Barium. **Marshall L. Barnhardt** was made secretary, Phoenix Bridge Co., **J. C. Coutant** secretary, Phoenix Iron & Steel Co.

Raymond I. Bond was appointed chief buyer at **Veeder-Root Inc.**, Hartford, Conn.

A. A. Archibald was elected vice president - special products and services of **Jones & Laughlin Steel Corp.**, Pittsburgh. This responsibility includes direction of the wire rope divison, warehouse division, electricweld tube division and container division. **H. S. Geneen** was elected vice president-controller.

W. Curtis Miller and **Leland E. Coulter** were elected vice presidents of **Allied Products Corp.**, Detroit. Mr. Miller, former general manager of Plant 4 at Hillsdale, Mich., assumes management of Plant 3, also of Hillsdale. The change results from resignation of **Walter S. Smith** who had been in charge of Plant 3 for several years. **John Gergel** replaces Mr. Miller at Plant 4. Mr. Coulter directs RB and Hercules interchangeable punch and die activities.

James D. Willson, formerly assistant treasurer of Brown Co., Berlin, N. H., was elected treasurer of **Affiliated Gas Equipment Inc.**, Cleveland. **John A. Wilson**, assistant secretary, was promoted to secretary. **Philip W. Scott** resigned as secretary, treasurer and vice president of the company.

OBITUARIES . . .

Joseph F. Knipper, 54, co-operator of **Joseph G. Knipper & Sons**, Rochester, N. Y., died Mar. 30.

Henry Duckworth, 82, retired vice president of **Norton Co.**, Worcester, Mass., died Apr. 1 in Florida.

Ralph G. Sweeney, 55, president and general manager, **Allyne-Ryan Foundry Co.**, Cleveland, died Apr. 12.

C. C. Bigelow, 56, president, **City Auto Stamping Co.** and **City Machine & Tool Co.**, Toledo, O., died Mar. 31.

Harry Ingraham, president, **Holdenline Co.**, Cleveland, died Apr. 3.

V.I.P.

treatment

You won't find it described in the books on metallurgy. But it's a mighty important factor here at Claymont in supplying you with carbon and alloy steel plates that are tailored to your specialized requirements.

To us it means *Very Important Plates.* It means individualized supervision of your order . . . particular attention to every detail of analysis, processing and inspection—right down the line from top to bottom.

Let us know your requirements—large or small. Our location in the heart of the Delaware Valley gives us complete access to convenient rail, water and highway transportation . . . enables us to efficiently and economically serve your needs.

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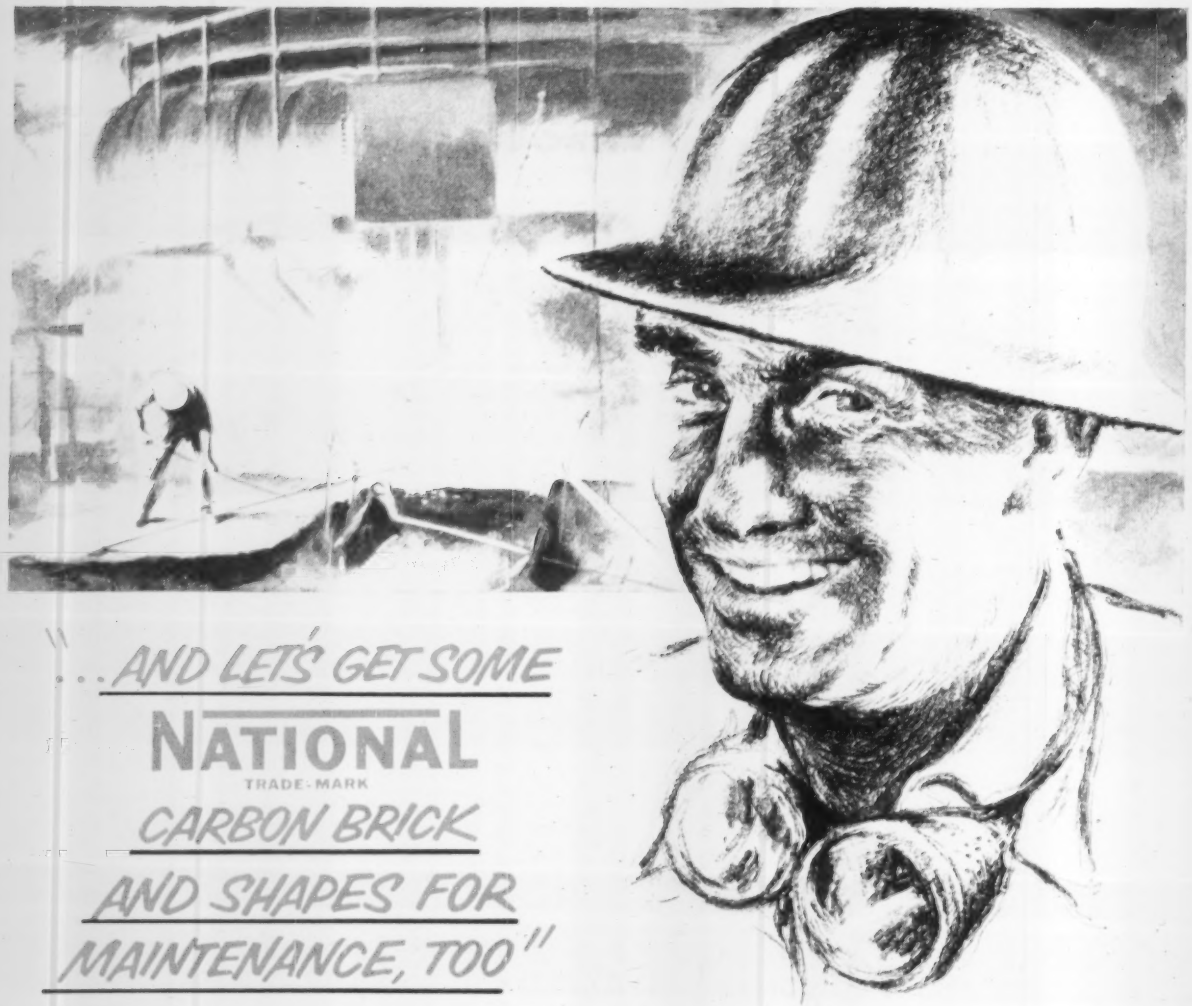

"...AND LET'S GET SOME

NATIONAL

TRADE-MARK

CARBON BRICK

AND SHAPES FOR

MAINTENANCE, TOO"

WHEREVER HOT METAL HITS, refractories take a beating. This is true *around* a blast furnace, as well as *in* it. That's why more and more operators are applying the lessons learned in *lining* blast furnaces to maintenance of *other* hot metal areas.

KEEP THESE STANDARD SIZES ON HAND FOR EMERGENCY!

13½" x 6" x 3" series

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9" x 4½" x 2½" series

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Write for Catalog Section S-6210

EXPERIENCE HAS PROVED the contributions of "National" carbon and graphite to better production, longer life and lowest maintenance-cost-per-ton in these and other applications:

- RUNOUT TROUGHS
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- BEDS AND TRAYS
- SPLASH PLATES
- STOOL INSERTS
- CORES
- SKIMMER PLATES

The term "National" is a registered trade-mark of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY

A Division of Union Carbide and Carbon Corporation

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Foundry Buys Equipment

Continental Foundry & Machine Co. boosts capacity for producing industrial machinery

INSTALLATION of about $3 million worth of machine tools has been completed by Continental Foundry & Machine Co., East Chicago, Ind. The new facilities in the firm's plants in that city and in Wheeling, W. Va., will provide the company with a much greater capacity for the manufacture of rolling mill equipment and other heavy industrial machinery. Continental Foundry also operates plants at Erie and Coraopolis, Pa.

Among the new installations at the East Chicago plant are a 100-ton crane and an 84-in. draw cut shaper. A duplicate of the shaper also was installed at the Wheeling plant. Other new machine shop equipment installed at the two plants includes slotting machines, horizontal bars, latest types of profiling lathes and several kinds of auxiliary machinery and equipment.

British Firm Goes to Canada

Vicom & Co. Ltd., a British firm specializing in radio, radar and electrical equipment for aircraft, will establish a plant in Kingston, Ont., through a subsidiary, Vicom & Co. (Canada) Ltd. The firm has leased a 10-acre site and four buildings in Kingston to make subassemblies for other Canadian manufacturers.

Army Tests Dozer Attachments

Army tests are being conducted at Ft. Belvoir, Va., with attachments which are interchangeable among the three most common bulldozers used by the armed forces.

Experience during World War II and the Korean conflict indicated that damaged parts on dozers sidelined many for long periods of time because replacement parts weren't available. However, if the parts had been interchangeable from one dozer to another, many vehicles could have been kept active.

Models of Allis-Chalmers, Caterpillar and International tractors have been modified in rear power take-off and mounting facilities and are being tested with various attachments.

Will Build Warehouse

Eastern Brace-Mueller-Huntley Inc., steel distributor, will have a new warehouse in West Albany, N. Y. A 28,000-sq-ft structure will be built this spring for lease to the firm and completion is scheduled for May. The company now has offices at 143 Washington Ave., that city.

Enameling Firm Expands Plant

California Metal Enameling Co., Los Angeles, erected a plant addition, providing 12,600 sq ft of additional floor space. Total plant area is now in excess of 67,000 sq ft.

Shipping Rate Inquiry Ordered

Investigation of shipping rates on iron and steel charged by railroads, motor common carriers and motor contract carriers in the Eastern Territory has been ordered by the Interstate Commerce Commission.

The action is a result of claims by the trucking industry of unfair rate structures granted to the railroads (see STEEL, Mar. 22, p. 39). Rates involved included those on iron and steel items between points in Connecticut, Delaware, District of Columbia, Kentucky, Illinois, Indiana, Maine, Maryland, Massachusetts, Michigan, Ohio, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia.

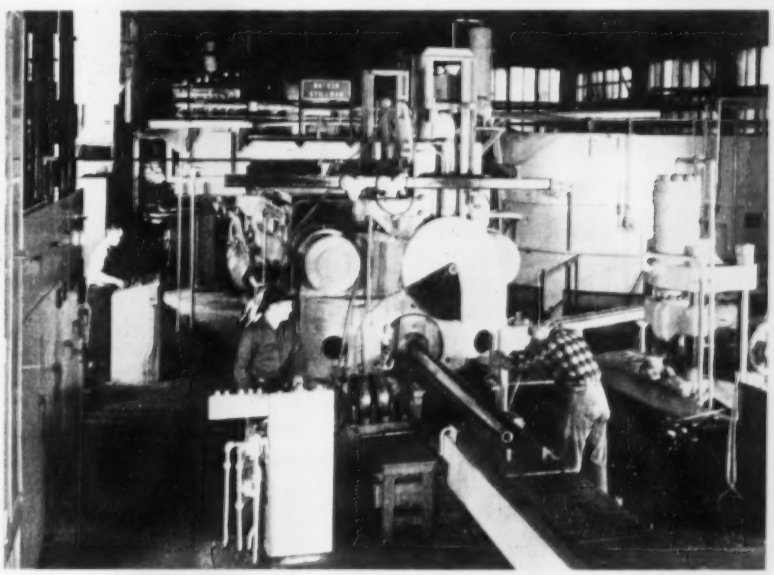
Can Company Begins New Labs

American Can Co. broke ground for its Research and Development Center at Barrington, Ill. The laboratory will contain about 102,000 sq ft and provisions will be made for expansion. In addition to administrative offices, the building will house laboratories devoted to food chemistry and nutrition, tin plate, coatings and other specialized research.

American-LaFrance Modernizes

American - LaFrance - Foamite Corp. announced plans to take the first major step in modernizing production facilities at the Elmira, N. Y., plant. President George R. Hanks said an estimated $500,000

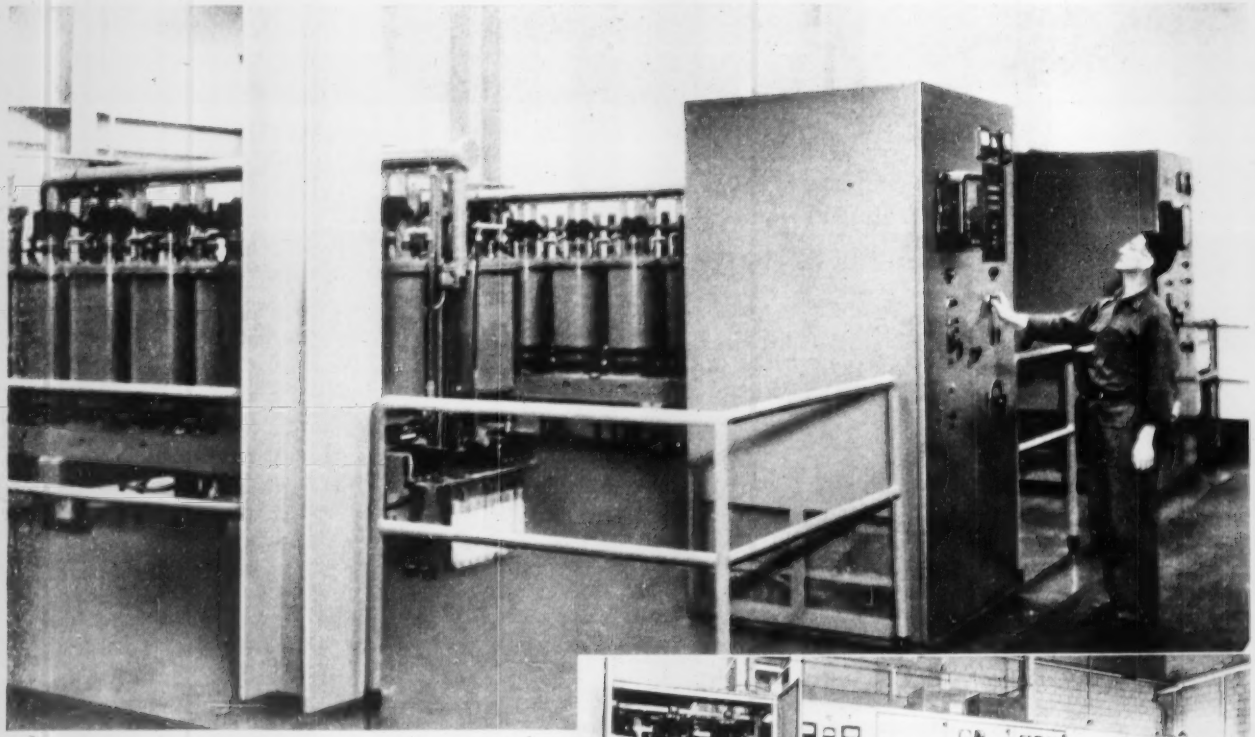
(*Please turn to page* 124)



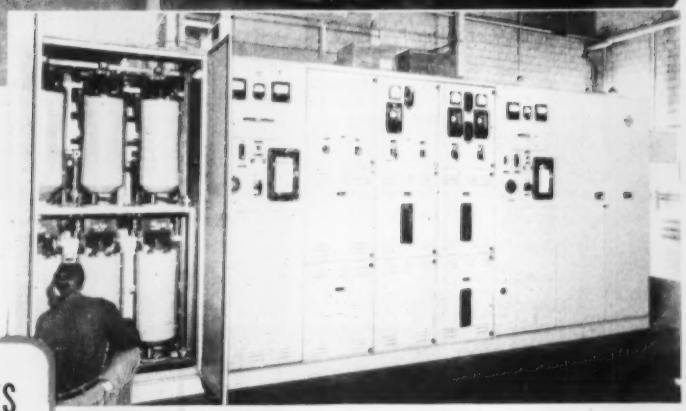
American Brass Installs Heavy-Duty Extrusion Press

A heavy-duty, horizontal extrusion press, recently installed in one of American Brass Co.'s Waterbury, Conn., tube mills, has increased greatly production flexibility and capacity for tube stock for drawing seamless tubes. The press exerts 1900-tons pressure on the main ram and 400 tons on the piercing ram, utilizing hydraulic pressure of 3000 psi. It extrudes round, solid billets up to 10 in. in diameter to produce tube blanks up to 6⅝ in. OD, weighing up to 350 lb

100% DC Power for



BILLET MILL RECTIFIERS: Two 1500-kw, 250-volt rectifiers supplying dc service to cranes and runout tables in 30 and 21-inch Billet Mills. Rectifiers are provided with automatic control and provisions for starting and stopping by manual or remote control.



COKE PLANT RECTIFIERS: One of two 500-kw, 250-volt metal-clad rectifier units supplying dc service to coke plant pusher and coke handling equipment in Coke Oven area. Units are factory assembled and wired, complete with dc switchgear and transformers.

*6 OUTSTANDING RECTIFIER FEATURES

1 **Continuous Excitation:** pilot arcs always present. Eliminates need for synchronized re-ignition. Enables rectifier to ride through severe ac voltage disturbances.

2 **Fixed Excitation Anode:** doesn't contact cathode mercury and is independent of level, turbulence or impurities . . . requires no adjustment, maintenance or replacement.

3 **Internal Cooling System:** high heat transfer with seamless tube cooling located within the rectifier.

4 **Enameled Anode Seals:** multi-layer fused vitreous construction provides high-strength seal unaffected by thermal variation.

5 **Grid Phase Control:** in cleaner region near anode, where ion density is lowest.

6 **Arc-over Free Tube:** insulating entire arc path eliminates danger of arcing over to tube.

ALLIS-

FAIRLESS

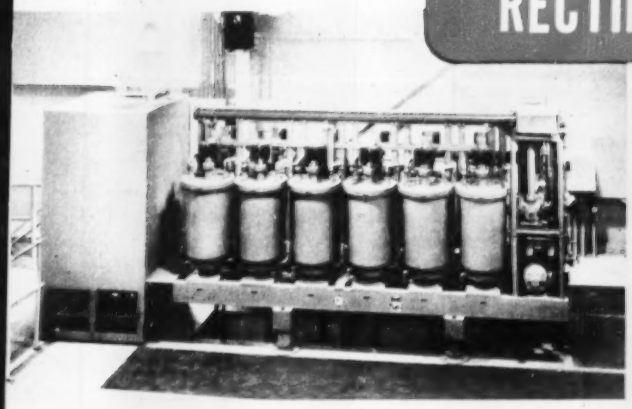
Material Handling

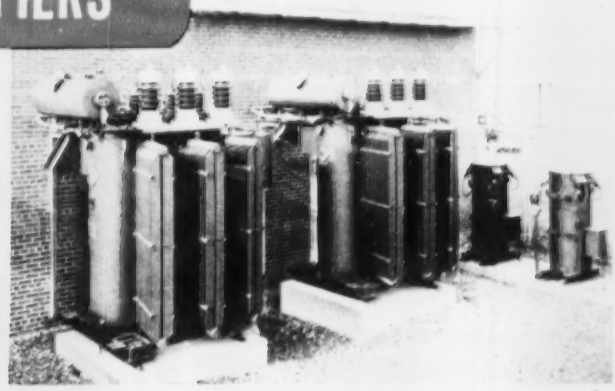
At Fairless Works of the U.S. Steel Corporation — the world's newest and most modern steel mill, continuous dc service is essential to material flow. Any interruption in this critical power supply would cause serious equipment damage and heavy production losses throughout the entire mill. Here, as in other mills over the United States, Allis-Chalmers mercury arc rectifiers are backing up their reputation for continuous, trouble-free operation under variable operating conditions.

In dc load centers located strategically throughout this gigantic plant, 19 Allis-Chalmers rectifiers produce *all* the 250-volt dc supply for every material handling operation . . . from unloading the ore to stockpiling finished steel. These rectifiers are designed and engineered for steel mill duty, and offer highest service reliability and efficiency with low maintenance features necessary for maximum mill output.*

For the same dependable dc service in your mill, specify Allis-Chalmers mercury arc rectifiers. Call your nearest A-C sales office for complete information, or write Allis-Chalmers, Milwaukee 1, Wisconsin. A 4302

ALLIS-CHALMERS
MERCURY ARC RECTIFIERS





OPEN-HEARTH FURNACE RECTIFIERS: One of two 1500-kw, 250-volt rectifiers supplying dc service to cranes, pig casting machines, bailer, slag cars, and stock house equipment. Provided with automatic control and provisions for starting and stopping by manual or remote control.

RECTIFIER TRANSFORMERS: Two 13,800-volt outdoor transformers feeding two 750-kw, 250-volt rectifiers in Central Maintenance shop. Rectifiers supply dc service to maintenance shop cranes, machine tool equipment and provide auxiliary power for electronic testing devices and welding machines.

CHALMERS

A-C ALLIS-CHALMERS

Our Engineers Introduced Mercury Arc Rectifiers to U.S. Industry

(Continued from page 121)
to $1 million will be spent in the program.

Mullins Denies Sale Rumors

Officials of Mullins Mfg. Corp., Warren and Salem, O., denied rumors of impending sale of the company to two different buyers, American Radiator & Standard Sanitary Corp. and General Motors Corp. The president of American Radiator had previously denied the rumors.

The report had indicated that General Motors was interested in the company because of Mullins' patented Koldflo process of steel extrusion. Mullins makes steel kitchens and other pressed steel products.

Dow To Process Sludge

Dow Chemical Co. at its Freeport, Tex., plant this summer will begin recovering magnesium from sludge, now stemming from its electrolytic production of the light metal.

Construction of the recovery unit is now under way and officials predict that the operation will recover about 2.5 million pounds annually. Dow's magnesium units at Freeport are currently producing magnesium at the rate of 140 million pounds annually.

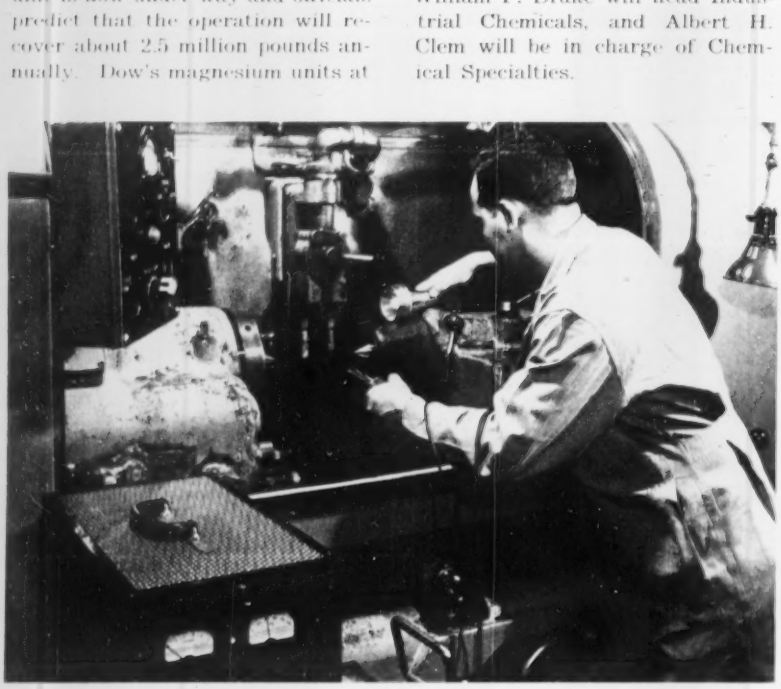
Recovery of the magnesium will be accomplished by crushing and milling the solidified sludge (until now dumped by Dow) to enable separation of the metal from the salts by screening.

Bethlehem Expands on Coast

Bethlehem Pacific Coast Steel Corp. will expand its 68-acre plant at Vernon, Calif. New features will include three electric-arc furnaces to replace a like number of open hearths, two new rolling mills and a wire mill.

New Divisions Established

Pennsylvania Salt Mfg. Co., Philadelphia, established two new operating divisions, announced George B. Beitzel, president. The new components, Industrial Chemicals Division and Chemical Specialties Division, will function as complete operating units responsible for both the manufacture and sale of their respective products. William P. Drake will head Industrial Chemicals, and Albert H. Clem will be in charge of Chemical Specialties.



Industry Gets Counterpart of Physician's Stethoscope

This portable instrument, a Vibraton, will locate abnormal vibrations in rotating parts of a machine without the necessity of dismantling it. The device simplifies the task of detecting out-of-balance parts while a machine is operating. It is used by Timken Roller Bearing Co., Canton, O., to maintain an accuracy within 75-millionths of an inch in production of bearings in commercial quantities

Armco Aquires Fabricator

Southwest Steel Products will be operated as subsidiary. Firm also expands in Middletown

ARMCO STEEL CORP., Middletown, O., acquired Southwest Steel Products, a steel fabricating company located in Houston. The latter firm's principal products are fabricated reinforcing bars, bar joists, roof deck and other items used in construction. Russell L. Jolley, president of Southwest, will continue actively in charge of the business which will be operated as a wholly owned Armco subsidiary under the general direction of R. L. Gray. Mr. Gray is vice president of Armco and president of the firm's wholly owned subsidiary, Sheffield Steel Corp.

Armco also launched a $430,000 expansion of its Fabricating Division in Middletown. The project will add 32,000 sq ft of floor space to the division's facilities and will include additional equipment for producing the wide variety of fabricated steel products that the plant turns out.

W. W. Sebald is president of Armco.

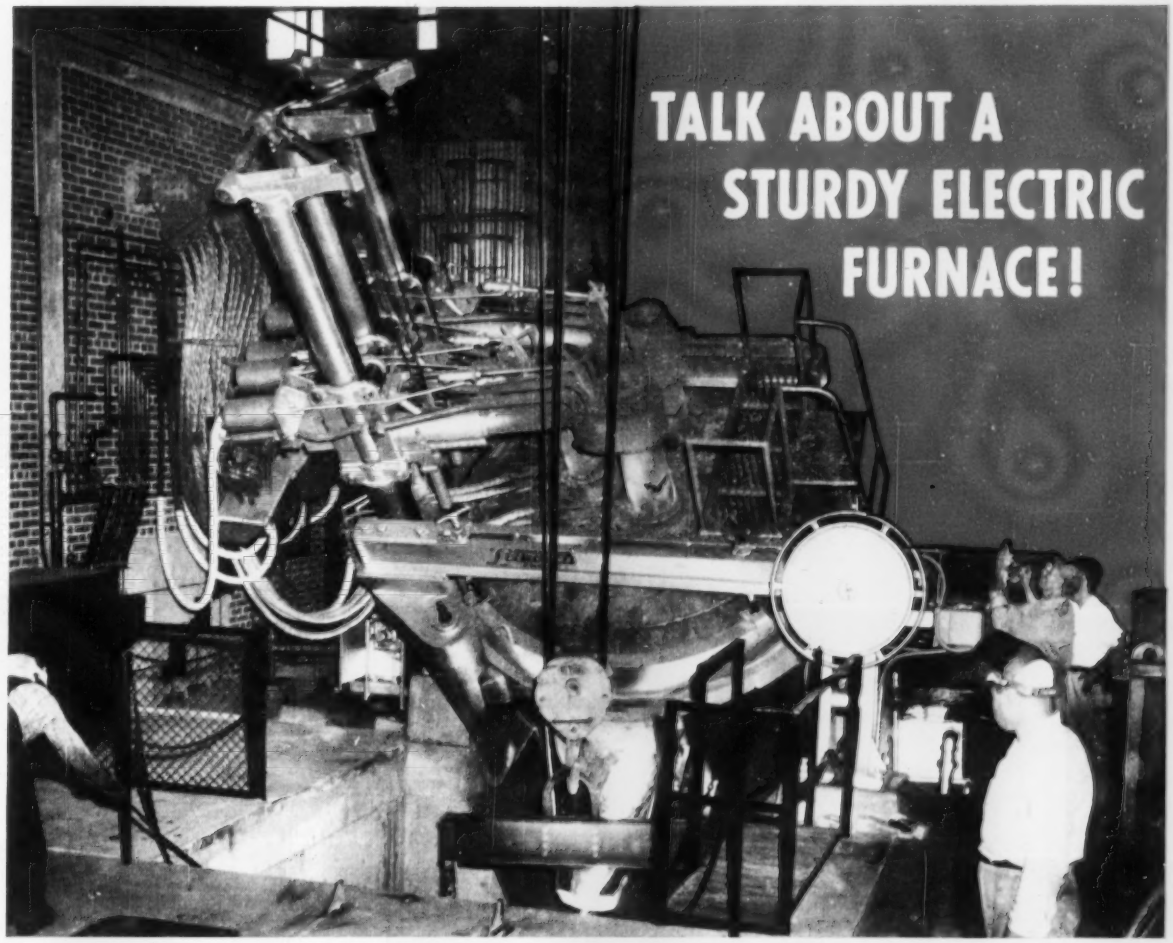
Bigger Color TV Tubes Coming

Officials of United Specialties Co., Chicago, say that manufacturing problems in fabricating 21-in. and 24-in. picture tubes for color television receivers have been solved by a new process they developed in co-operation with Westinghouse Electric Corp. The body of the tube is of a special stainless steel supplied by Armco Steel Corp., Middletown, O.

Straddle Truck Film Released

Applications of the straddle carrier type of industrial trucks in diverse industries are portrayed in a sound film now available from Clark Equipment Co., Buchanan, Mich., manufacturer of materials handling industrial trucks, construction equipment and heavy transmissions and other drive components for the automotive industry.

The film was shot on location at plants all over the country so that typical operations of the



"Our old Lectromelt takes the power overload of an oversize transformer without a sign of strain to the furnace or its parts." — Duncan Foundry, Alton, Illinois

Look at the record of Duncan Foundry's durable Lectromelt*

In October 1952, this test was made on their 1½-ton per hour Lectromelt: The furnace operated steadily for 27 days, 24 hours per day, using an oversize, 2000-kva transformer. 578 heats were tapped for an average of 21.4 heats per day. Average charge per heat was 6688 lbs. Time from power-on to tap averaged 58.5 minutes per heat. Time from tap to power-on for next heat averaged 8.8 minutes. Average power consumption per ton of metal was 501 kwh.

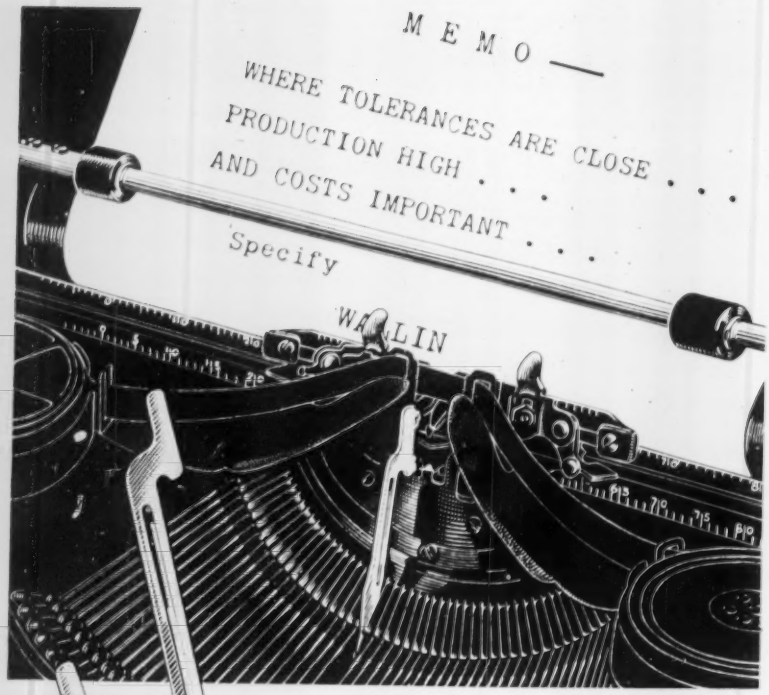
Duncan's oversize transformer keeps metal pouring fast, but throws a jolting overload of power into the furnace to do it. Still operating under this maximum stress, their sturdy Lectromelt turns out daily heats without a sign of extra strain or wear.

Expanding recently, Duncan Foundry added another, larger Lectromelt Furnace, confident of its quality and durability.

Look for your new electric in Lectromelt's Furnace line. Write for Bulletin No. 9, describing these versatile melting, smelting, refining and reduction furnaces. Write Pittsburgh Lectromelt Furnace Corporation, 323 32nd Street, Pittsburgh 30, Pennsylvania.

Manufactured in . . . ENGLAND: Birlec, Ltd., Birmingham . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Bressoux Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa. JAPAN: Daido Steel Co., Ltd., Nagoya

WHEN YOU MELT... MOORE RAPID *Lectromelt*



WALLINGFORD

CLOSE-TOLERANCE

STEEL STRIP

When it comes to precision parts like type bars, leading typewriter manufacturers specify Wallingford Steel Strip. They've found that the smooth surfaces and closely held thickness tolerances mean reduced fabricating and finishing costs and insure accurate spacing with smoother, quieter typing action.

The uniform high quality of Wallingford Steel Strip and Tubing doesn't just happen; it's the result of experience, know-how and a determination to produce the best . . . combined with the finest, most up-to-date equipment available. Our new Sendzimir mill, for example, can roll steel strip down to .002" thick and . . . equipped with the most advanced continuous gages . . . will maintain accuracies to ± .0001".

A growing list of satisfied customers look to Wallingford Steel for those important extra values in product quality and service. You too will find that Wallingford can meet your most exacting specifications for size, finish, analysis and temper . . . and can deliver *what you want when you want it.*

Call us today. We will welcome the opportunity to cope with the tough problem.

THE **WALLINGFORD** SINCE 1922 **STEEL** CO

WALLINGFORD, CONN. U.S.A.

LOW CARBON • HIGH CARBON • ALLOY • STAINLESS • STRIP and TUBING

straddle carrier in a wide variety of industries could be covered. Clark recently established Ross Carrier Division for its Ross line of straddle carriers. A. H. Peirce is division manager.

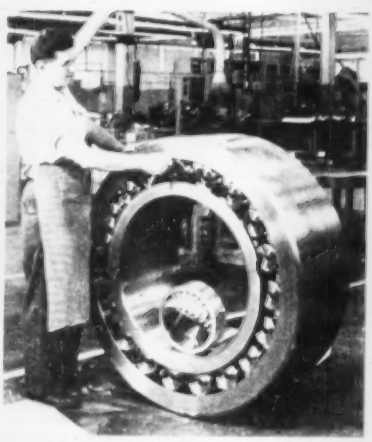
Airlenco Takes Over Air-Line

Airlenco Inc., Mansfield, O., took over the proprietary business formerly operated as Air-Line Engineering Co. and will produce the same compressed air equipment with some additions to the line. T. J. Farquhar is president and sales manager, and C. N. Walter is secretary-treasurer and production manager.

ASSOCIATIONS

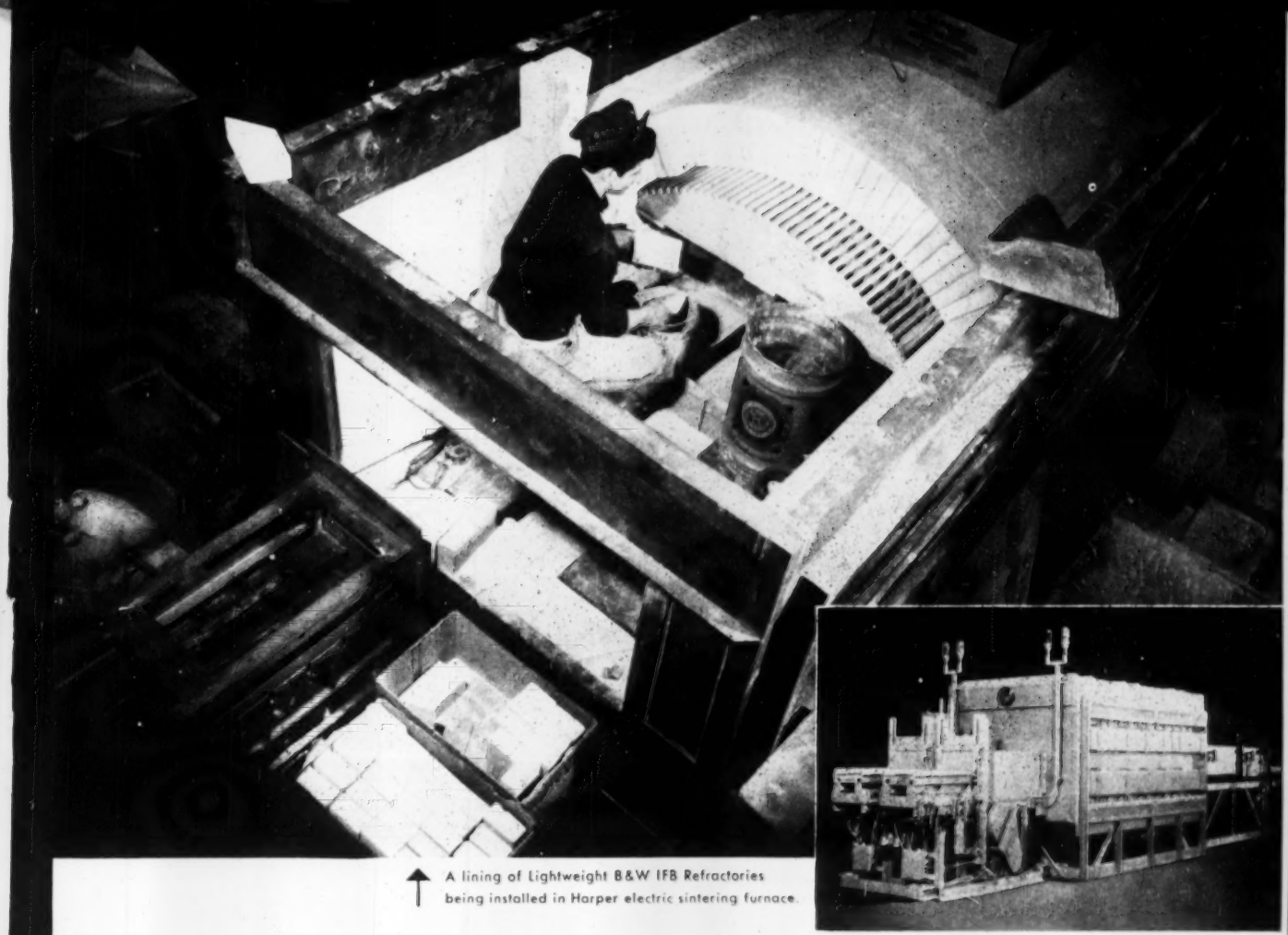
Gen. John J. O'Brien, president, United States Steel Homes Inc., New Albany, Ind., was elected president of **Prefabricated Home Manufacturers' Institute**, Washington.

R. P. McKenrick, manager, construction equipment department, Blaw-Knox Co., Pittsburgh, was elected chairman of the **Manufac-**



SKF Turns Out Big Bearing

Shown for comparison at SKF Industries Inc., Philadelphia, is a small roller bearing used in a tube reducing machine that takes ingoing tubes up to 2¼ in. OD and a bearing for a machine that will take ingoing tubes up to 18 in. OD. The larger reducer is for Tube Reducing Corp., Wallington, N. J.



A lining of Lightweight B&W IFB Refractories being installed in Harper electric sintering furnace.

Refractories Maintenance Cut Down

ON HARPER ELECTRIC FURNACES AND KILNS

"Furnace linings that don't last as long as they should can shoot our customers' production costs 'sky high' —and take a big bite out of their profits."

That's one of the reasons why Harper Electric Furnace Corporation standardized on B&W Insulating Firebrick for the electric kilns and furnaces which they manufacture. They know from experience that "B&W IFB last longer than any insulating firebrick we ever tried."

The reason? Volume stable raw materials, unique quality control and manufacturing processes, including B&W's exclusive double burning at temperatures well above use limits—all these factors contribute to more uniform brick and longer life.

B&W IFB, the lightest weight insulating firebrick, also offer these advantages:

Cut electricity or fuel costs—Lighter in weight than any other insulating firebrick, B&W IFB store and conduct less heat. This means faster heating up time, less heat loss during furnace operation. Results? Lower electricity or fuel consumption —often 30% to 50% less than with ordinary heavy firebrick.

Cut installation costs—Hand fitting is easy and fast—B&W IFB can be cut, drilled or shaped on the job with ordinary hand woodworking tools.

Cut down-time—B&W IFB cool off quicker because they store less heat —make possible quick access to the furnace for inspection. Furnace gets back on the line faster, too, because B&W IFB heat up quickly.

These savings explain why B&W Insulating Firebrick are being used in thousands of applications . . . from the largest industrial furnaces to the smallest kilns. Contact your local B&W Refractories Engineer. He may point the way to new savings in your furnace.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.

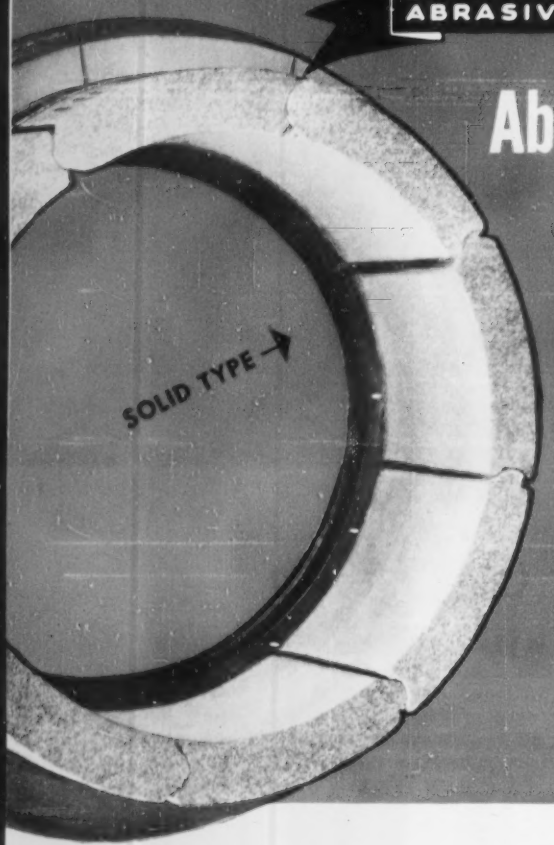
B&W REFRACTORIES PRODUCTS—B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars

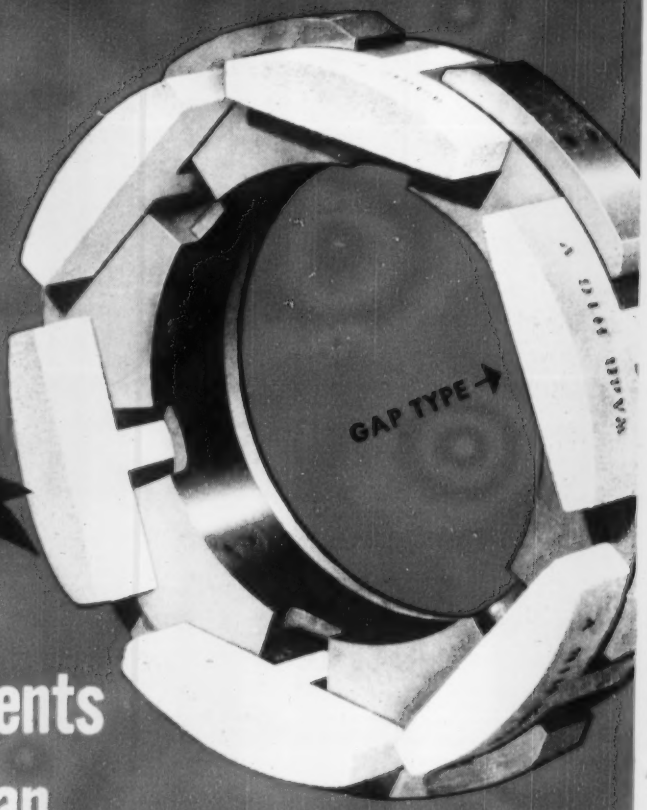
R 494

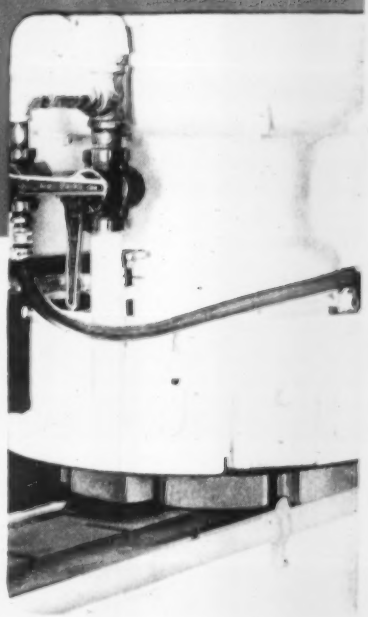
any way you look at it...

SIMONDS ABRASIVE CO.

Abrasive Segments mean surface grinding with savings







Less expensive than cylinder wheels. More uniform in grinding characteristics. Easily handled. Quickly mounted. Fast cutting. Compact for less storage. Fit all types of chucks. Gap type for large flat surfaces—solid type for small pieces grouped or chucked together. Write for bulletin ESA-188.

SIMONDS ABRASIVE COMPANY • PHILADELPHIA 37, PA.

BRANCH WAREHOUSES: BOSTON, DETROIT, CHICAGO, PORTLAND, SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES

DIVISION OF SIMONDS SAW AND STEEL CO., FITCHBURG, MASS. • OTHER SIMONDS COMPANIES: SIMONDS STEEL MILLS, LOCKPORT, N.Y., SIMONDS CANADA SAW CO., LTD., MONTREAL, QUEBEC AND SIMONDS CANADA ABRASIVE CO., LTD., ARVIDA, QUEBEC

turers Division, National Sand & Gravel Association, Washington.

Frank A. Cowan, assistant director of operations, Long Lines department, American Telephone & Telegraph Co., was awarded the 1953 Lamme Gold Medal by American Institute of Electrical Engineers.

REPRESENTATIVES

Nobur Mfg. Co., Burbank, Calif., manufacturer of deburring and chamfering tools, appointed as representatives Arthur S. Darling & Associates, Detroit; J. J. Ricketson, Overland Park, Kans.; and James Morton Co. Ltd., Galt, Ont.

Nutting Truck & Caster Co., Faribault, Minn., appointed E. C. Buehrer Co. Inc., San Francisco; Production Equipment Co., Meriden, Conn.; and Rushmore, Weber & Case Inc., Latham, N. Y., as representatives in those territories.

Promat Division of Poor & Co., Waukegan, Ill., appointed Industrial Materials Co., San Francisco, as Northern California distributor for Promat metal finishing processes.

Thor Corp., manufacturer of home appliances, opened its first factory sales division in Los Angeles for distribution in eight Southern California cities and counties.

Smith bulldozers, root dozers and angle dozers, made by **Northern Machine Works Ltd.**, Bathurst, N. B., will be sold exclusively by International Harvester Co. of Canada Ltd.

Whitney Chain Co., Hartford, Conn., appointed Macaulay Machinery Co., Rochester, N. Y., as exclusive sales representative in northern New York state for the Hanson-Whitney line of machine tools. Fiagus Machinery Co., Buffalo, was named exclusive distributor for western New York state.

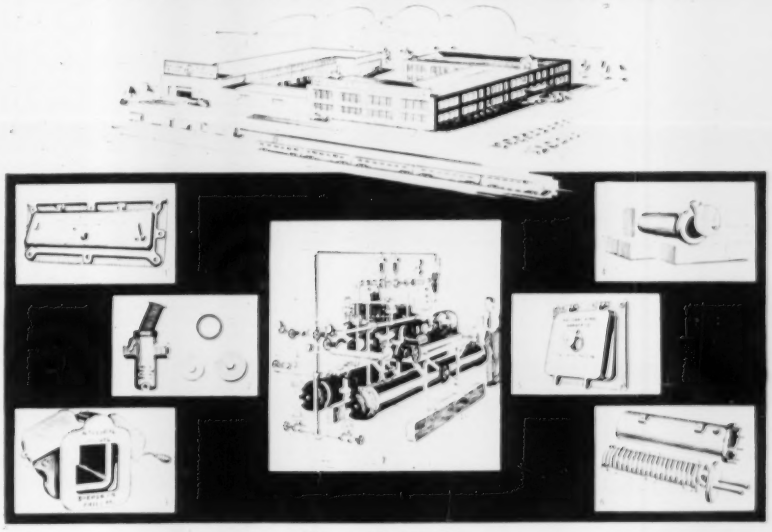
Devoe & Raynolds Co., New York, licensed Bakelite Co., New

(*Please turn to page* 132)

A Complete Line of

COMBUSTION

ACCESSORIES



***for* EVERY**

INDUSTRIAL LIQUID FUEL-GAS INSTALLATION

1. Air Control Door and Frame, top hinged, ratchet type, heavy duty, for manual control. Surfaces are machined to a close fit.
2. Fuel Oil Suction Strainer,-single type. Large basket area insures low pressure drop; cover and basket easily removed for cleaning.
3. Wide-View Peephole, safety, curtain type. Cobalt glass removed to show bearing surface for curtain. Curtain halves are interlocked—open simultaneously.
4. Ignition Port with Refractory Tile No. M896 . . . for use with standard 3" pipe. Also serves as a peephole.
5. Furnace Relief and Access Door, heavy construction, practically air tight. Door casting correctly weighted, lined with plastic refractory retained by imbedded grill, with observation port and cover.
6. Fuel Oil Heater, Self-Cleaning, Spiral Coil type. High oil velocity in coil, resultant turbulence prevents carbon formation. No internal connections or joints.
7. Fuel Oil Pumping and Heating Unit . . . Twin or Single Pumps, Steam driven, Electric driven or combination Steam-Electric, with Single or Double Fuel Oil Heaters and accessories for feeding oil at constant pressure and temperature.

. . . yes, just as we are proud of supplying the *right* liquid fuel or gas burning equipment (over 40 years experience throughout industry), so, also, are we proud of our full line of highest quality accessories to supplement your every combustion need. Within our modern, "daylight" factory, salesrooms and general offices NATIONAL AIROIL likes and adheres to the phrase, "nothing but the best"! We believe that our record speaks for itself . . . i.e., the "right combination" for you in achieving maximum combustion economy is: NATIONAL AIROIL Fuel Oil, Gas or Combination Oil and Gas Burning Equipment; NATIONAL AIROIL Combustion Accessories; and, NATIONAL AIROIL Engineering Consultation.

May we be of help to you in accomplishing your particular installation or in solving that difficult problem?

NATIONAL AIROIL BURNER CO., INC.

1392 EAST SEDGLEY AVE., PHILADELPHIA 34, PA.
Southwestern Division: 2512 South Boulevard, Houston 6, Texas
INDUSTRIAL OIL BURNERS, GAS BURNERS, FURNACE EQUIPMENT

The Big Trend in Metalworking...

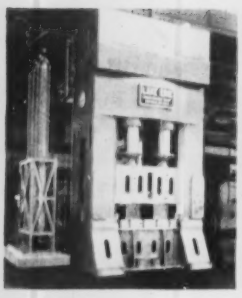
MOVE the metal ...it's cheaper than

HOW NEW METHODS SAVE BIG SUMS

A Parts are produced primarily by forcing metal into the desired shape rather than by "removing" or "machining" it. It is far faster — saves tremendously in time and labor.

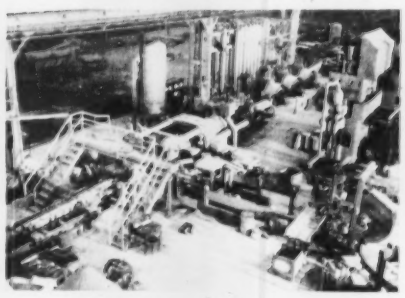
B The amount of metal in the initial slug, shot, billet, sheet, etc., is only slightly more than the total amount in the finished piece. Thus scrap and machining are held to an absolute minimum.

Metalworking plants casting about for ways to reduce production costs are turning more and more to the newer methods of forging, drawing and extruding in which metal is being "pushed around" rather than "removed." These processes basically are the hot extrusion of alloy steel, cold "pressure" forging of aluminum, cold extrusion of steel, and high pressure closed die extruding of aluminum and other non-ferrous alloys. Also falling within this category

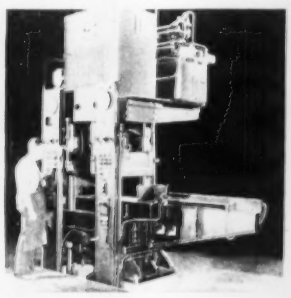


Closed die extruding of heated aluminum reduced production time 90%

Cold steel extrusion reduced scrap 44%



Hot alloy steel extrusion is now an established art



Metal powder parts are often produced with no machining

- *New and improved production techniques save millions... arouse widespread interest*

1. Actual parts production is cut from hours in typical cases to minutes or even seconds.
2. Pieces generally have superior finish and improved physicals including grain structure.
3. Tolerances and uniformity equal or better those of older methods.
4. Scrap is greatly reduced and in many cases practically eliminated.
5. Unit costs go way down.

REMOVING it!

are somewhat older though greatly changed and improved methods for the extrusion of aluminum, hot forging of ferrous metals, powder metallurgy, deep drawing of sheet and die casting. The most recent developments involve variations and combinations of the above applied to many products and materials. Our engineers are in close daily contact with these developments. They'll be glad to help apply any of them to your production. Call or write us.

LAKE ERIE HYDRAULIC PRESSES

LAKE ERIE ENGINEERING CORP.

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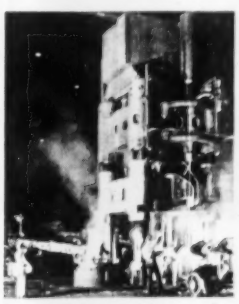
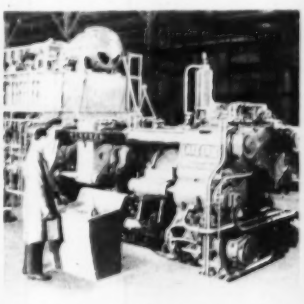
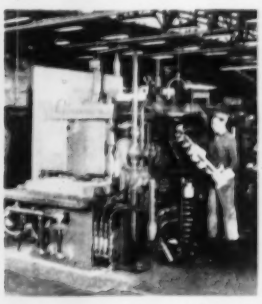
HYDRAULIC PRESSES • DIE-CASTING MACHINES
ROLLING MILL AUXILIARY EQUIPMENT



New developments in steel forging have greatly expanded its application.



Non-ferrous extrusion installations now embrace titanium, magnesium and newer metals.



Production rates of die-cast aluminum and zinc parts have been upped 20% to 30%.

PACKAGED INSTALLATIONS

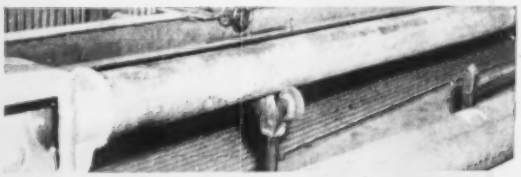
A new service by Lake Erie which enables you to order an integrated installation including production equipment, tooling, auxiliary equipment and advisory service from a single source thereby saving time, money and trouble.

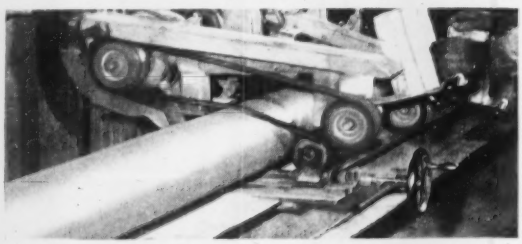
(Over, please)

HOW WOULD YOU

Solve it?

1 PRODUCTION PROBLEM: To cut unit costs of polishing aluminum street lighting standards, Pfaff & Kendall Inc., was finishing one 30-foot pole per hour by hand sanding its entire length as it rotated in a lathe bed.





2 SOLUTION: A 3M Representative suggested that this Newark, N.J. manufacturer switch to the 3M Method using Three-M-ite Resin Bond belts installed on two swing grinders mounted in tandem. Poles were rotated in the lathe bed as before. Grinding was done *behind* the contact wheel on the unsupported belt.

3 RESULTS: An immediate production increase from 1 to 4 finished standards per hour, with a higher quality finish. Each belt finishes 10 or 11 poles, with far less operator fatigue. A 3M Representative can help *you* solve your grinding problems, too. His services are available without cost or obligation. Send coupon for facts.

3M ABRASIVES

Want More Information?

MINNESOTA MINING & MFG. CO.
DEPT. S-44, ST. PAUL 6, MINN.

Send me free booklet: "Case History Reports on 3M Abrasive Belts"
Please have 3M Representative call

Name Title
Company
Address
City Zone State

Made in U.S.A. by Minnesota Mining and Manufacturing Company. General Offices: St. Paul 6, Minn. In Canada: London, Ont., Can. Export: 122 E. 42nd St., New York City. Makers of "Scotch" Pressure Sensitive Tapes, "Scotch" Sound Recording Tape, "3M" Adhesives, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety Walk" Non-slip Surfacing.

AEC Buys Containers

This special portable container for field storage of atomic energy project supplies, equipment and instruments was developed by Dravo Corp., Pittsburgh. It has double doors at both ends and is fabricated of welded steel

(Concluded from page 129)

York, a division of Union Carbide & Carbon Corp., to operate under epoxy resin patents held or controlled by Devoe & Raynolds. Epoxy resins are used in protective coatings, as adhesives, in bonding and laminating applications and for parts in the automotive field.

Crucible Steel Co. of America, Pittsburgh, opened a field office in Columbus, O. D. W. Sturges, sales engineer, has been assigned to the new office.

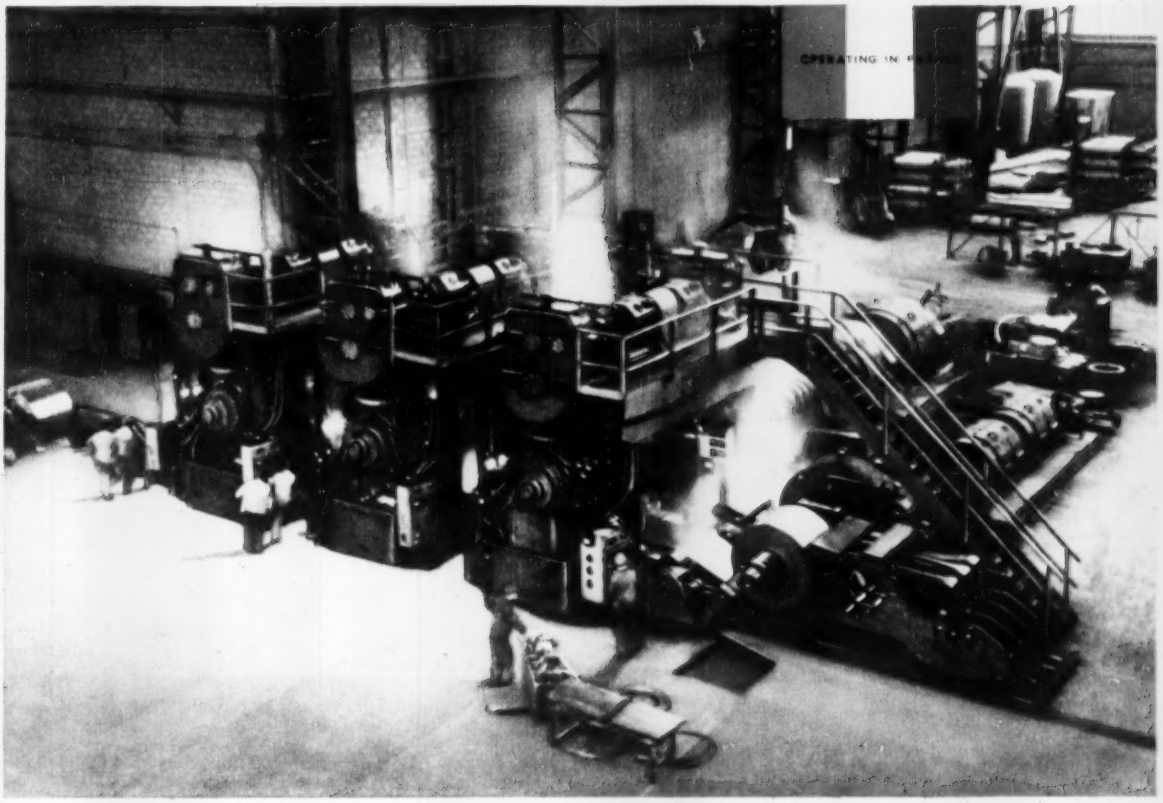
A West Coast sales office and warehouse was opened in Los Angeles by **Cleveland Cap Screw Co.,** Cleveland. John E. Harrington is in charge.

Dravo Corp., Pittsburgh, opened a West Coast office at San Francisco to handle Dravo's complete line of heaters and drying equipment, piping, flooring and other products and services. The office will also represent Walker Process Equipment Inc., maker of water, sewage and industrial waste treating systems.

Jones & Lamson Machine Co., Springfield, Vt., opened a district office at Charlotte, N. C. E. H. Wells is manager.

UNITED

4-HIGH 3-STAND TANDEM COLD MILL



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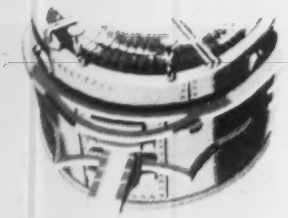
ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

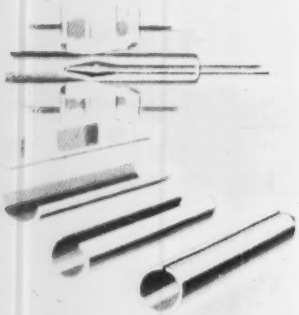
7 REASONS WHY

Ostuco Single Source Service Saves You Money!



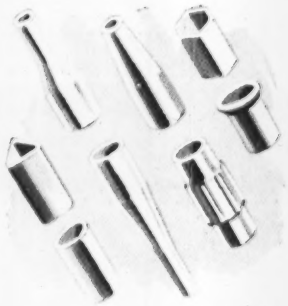
Wherever you use tubing in any form . . . or wherever the advantages of tubing will make your product more competitive . . . OSTUCO's *single source service* can save you money. One purchase order takes care of all details. Every manufacturing step from raw materials to finished product is carefully controlled and quality-checked. Your production schedules are rigidly maintained. Other advantages of OSTUCO's *single source service* are outlined in an informative booklet, "Ostuco Tubing," yours for the asking. Or better still—for conclusive proof—send us your blueprints for prompt quotation.

1. OUR OWN STEEL SOURCE. As a member of the Copperweld family, Ostuco controls its own steel supply . . . your assurance of prompt deliveries.



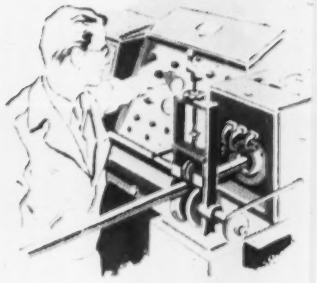
2. SEAMLESS AND WELDED TUBING. As manufacturers of both seamless and electric welded steel tubing, Ostuco's facilities are flexible to meet your needs.

3. VARIOUS ANALYSES. Ostuco offers carbon and alloy steels which meet all ASM, AMS, ASTM, AISI, and Federal specifications.



4. FABRICATING AND FORGING. Under one roof, Ostuco's modern equipment and skilled craftsmen provide uninterrupted manufacturing, fabricating, and forging service.

5. SPECIALTY ITEMS. Ostuco is especially geared to handle smaller production quantities with the same economy normally possible only in larger runs.



6. QUALITY CONTROL. Rigid inspection and precision tests at various stages of manufacture assure homogeneous quality and uniformity.

7. CONSULTANT SERVICE. The diversified knowledge and experience of Ostuco's engineering and design departments is always at your service.

OSTUCO SHELBY, OHIO

OSTUCO TUBING

SEAMLESS AND ELECTRIC WELDED STEEL TUBING —Fabricating and Forging

OHIO SEAMLESS TUBE DIVISION
of Copperweld Steel Company • **SHELBY, OHIO**
Birthplace of the Seamless Steel Tube Industry in America

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CANADA, RAILWAY & POWER CORP., LTD.

EXPORT: COPPERWELD STEEL INTERNATIONAL COMPANY
117 Liberty Street, New York 6, New York

STEEL
April 19, 1954

TOOLING FOR COMPETITION

TODAY's competitive economy has thrust new responsibilities on the tool engineer.

Historically, his job has been translating plans into production performance. Of course, tooling of the job remains a key facet of his work, but now he is being called in on the initial policy discussions, to add his experience toward making the right decisions the first time—decisions that include the design of a product, selection of tool and die materials, specification of equipment, etc.

As a special contribution to this work, STEEL presents an up-to-the-minute survey of tool and die materials, a report on efficient design and application of jigs and fixtures and a report on one new phase in the tool engineer's daily routine.

Tool Engineer Moves Up 136

Tips to Lower Tooling Costs 138

Tool and Die Materials Forum 140

Contributors

E. J. Reitler
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Frank L. Bogart
Jacob S. Disston Jr.
L. V. Klaybor
Harry W. Highriter
T. G. Barnes
G. K. Simonds Jr.

ASTE Program of Conferences 150

ASTE Exhibitors 168

By ROBERT F. HUBER
Machine Tool Editor

THE TOOL ENGINEER MOVES UP

New Voice at the

His new role involves the same decisions and problems as before. Difference is in timing. He is now consulted before the final, top-level decisions are made

YOU DON'T expect to hit 100 per cent production efficiency, but still you probably don't agree with the saying, "Close only counts in horseshoes." Every management man reaches for perfection; and the closer he comes, the better he likes it.

Pooling Know-How—At least part of the problem is in making right decisions and plans the first time. Sometimes this can be done by a management genius, but more often than not, it is accomplished by drawing on a variety of specialists who can add their knowledge and experience to the management round-table.

This is where the tool engineer comes in. This is his new role. He is no longer thought of as simply the man who takes an assigned product and fits it to a prescribed process.

As an example, for over a year an eastern manufacturer machined and inspected two gears and then welded them together. The weld was to relieve stress on the spline shaft. Finally someone pointed out that the two gears could be made faster and cheaper if they were machined from a common piece of bar stock. Savings for this seemingly simple step are $2 a piece, and they're made by the thousands.

Almost Equal—Actually this new role for the tool engineer involves the same decisions and problems that he has had. The difference is in the timing.

Instead of being handed the product and asked to make it, he is now consulted before the final decisions are made. His production know-how is applied to the product design, sequence of operations, estimations of potential production rates and of unit costs, plant or production line layout and equipment specifications.

Pooled Resources — Westinghouse Electric Corp. just completed a new plant in Columbus, O., which will be used for the manufacture of refrigerators. C. L. VanDeran, general works manager, Mansfield, O., plant, points out that, "When we engineered and built our new refrigerator plant, we relied on the combined experience of all our men.

"Tool engineers were called in on the initial discussions to advise on the tooling department, general plant layout and equipment specifications. We drew on the experience and know-how they had gained in making refrigerators at our other plants and used it as a guide to prevent our making costly errors which would then have to be corrected.

Pre-Design—At the Caterpillar Tractor Co., Peoria, Ill., it's the practice for tool and product engineers to consult with each other before finalization of their designs. This practice is followed in the designing of new products as well as contemplated changes to the design of models already in production. The tool

Management Level

engineer contributes his knowledge of the available manufacturing facilities; he recommends changes to the products designer which will permit the processing of the parts over existing machinery and tools in order to minimize the cost of placing the parts in production. He recommends processing methods to establish locating points on the part to insure quality as well as economical production.

These recommendations are considered by the products designer, and, if the recommended changes are compatible with the function of the part, the changes are incorporated in this design. Where the introduction of a new model will require major changes in a machine or perhaps an entire line of machines, the tool engineer establishes the probable amount of time the facilities will be out of production for conversion. This information is given to the production department so they can start at the earliest possible date to produce parts to carry the assembly line through the conversion period.

A recent example was the redesign of the DW 20 tractor. Final drive case mill had to be widened by moving the side heads out 6 inches on each side and a new fixture installed. It was estimated that the machine would be out of production for three weeks, so three weeks lead time was built up before starting the job.

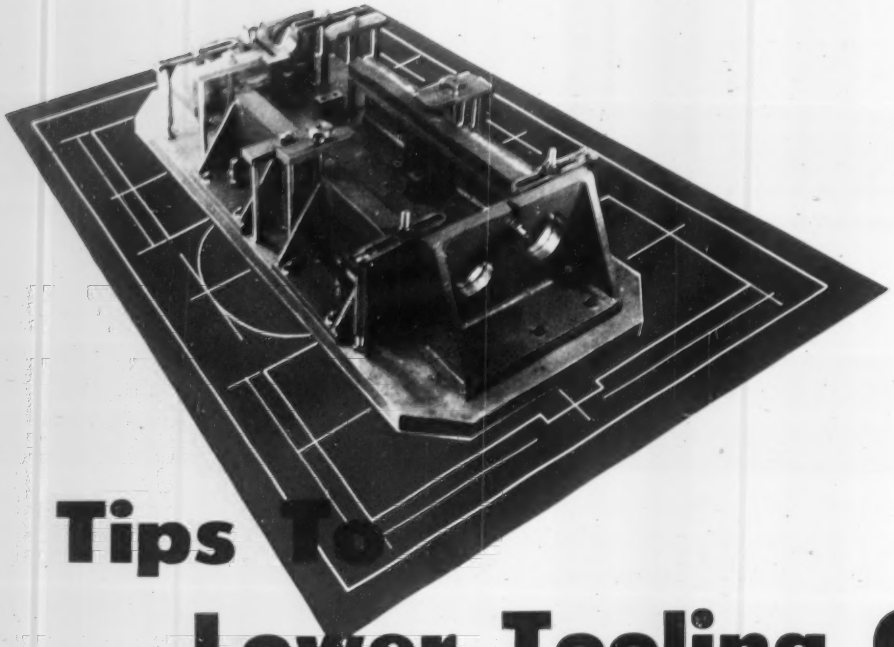
Final Decisions—With the aid of these and other detailed considerations analyzed, the complete transformation to the new job had been made on paper. Recommendations and suggestions were taken to top management for further discussion and approval.

Actual transformation went smoothly. The new line was in operation well within the deadline and operating at its estimated capacity.

Stitch In Time—Commenting on one of the phases of this procedure, Gordon Swardenski, assistant manufacturing manager of the Peoria plant, says, "There is no question but what the tool engineer should be called in before a new part reaches final design stages. His specification of locating points, clearances for pilot bars, etc., will save both time and money which might be lost through error."

In one case the company saved about $30,000 simply by respecifying a tolerance. That investment would have been necessary to purchase a machine capable of working within the limits required.

Growing Potential—With the ever-growing demand for efficient, low-cost production, and the continuing trend toward automation and automatic processing, the cost of management errors will be magnified. The need for practical experience application to key decision will increase and there will be a seat reserved at the management roundtable for the tool engineer.



By A. S. HECKER
A. W. Hecker Co.
Cleveland

Tips To Lower Tooling Costs

If the user would only realize what some of his whims and arbitrary specifications cost him on his tooling bill! Too many of them don't, observes this expert

TOOLING is the key to a successful finished product in all types of manufacturing. Whether we are in a period when price is king or in a period when delivery is of the utmost importance, companies employing the best functional tooling leave competition far behind.

In the constant battle to lower tool costs, many progressive shops incorporate new or improved methods almost daily. But a large portion of the responsibility for producing finer tools at lower prices rests with the process planner and the tool designer. Intelligent planning by these two can mean the difference between a necessary tooling and a profitable tooling expenditure.

Supervision Needed

It is common practice when tooling a new or revised product to place the process engineering and or tool designing with outside firms that provide this engineering service. Right at this point many customers overlook the first phase of economy production. They do not properly supervise their designing work after it has been placed with the vendor.

Untold dollars are wasted on designs that prove to be almost impossible or completely impossible to build. This waste might not have occurred if the vendor had been properly and closely supervised by qualified representatives of the customer, or better yet, if the work had been placed with companies having engineering departments that worked closely with the shop and provided a contract engineering service. In either case, close customer supervision of tool design in the vendor's location, or in the customer's department will result in tremendous savings in the tooling cost and greatly improve the final tool amortization figure.

Tolerances vs. Common Sense

Today it is especially true that tooling dollars wisely spent will produce higher production at lower cost. This does not necessarily mean, however, that cheap tools save the most money. It does mean that dollars spent for what are known as "gold plated tools" or tools loaded with "ginger-bread" are dollars that might well be spent for tools that would perform more than one operation or, on the other hand, more single purpose tools where this is advantageous.

It is very easy for an engineer to write "±.0002" but quite another problem to maintain it on a machine. Granted, there are certain dimensions where extremely close tolerances are necessary for the successful operation of the tool. Quite often, these "tight" tolerances are not actually required, and in the final analysis, the designer simply wanted to turn out an impressive looking tool drawing. The difference in the building cost between ±.0002 and ±.002 can be figured in many hundreds of dollars.

Beauty vs. Utility

It can safely be said that most manufacturers prefer to have beautifully finished jigs and fixtures

on their production line. Many feel that better looking tools evoke better workmanship from the men using them.

This idea has merit, but it bears close scrutiny inasmuch as unnecessarily finished surfaces can be extremely costly and could possibly over balance any advantage that might be gained in production workmanship.

Materials and Methods

It is vital that customers' engineering departments and all dependable design companies be constantly abreast of technical advances in materials and methods. Similarly, it is just as vital that design personnel are aware of shop costs and the advantages to be gained by designing tools with an eye toward practical tool construction.

Simple shifts to welded construction, for instance, can save the time and money involved in building a pattern and pouring a casting to say nothing of the danger of excess porosity and the presence of chill spots. Cost conscious design supervision by the customer can help promote more sensible tool designs. Mistakes at this stage can cost real money.

Current Catalogs

It is extremely vital that catalog libraries in engineering departments be kept up to date and used by the designers. More often than not, process planners and tool designers refer to equipment catalogs or product specification sheets which are close to ten years old.

When the department head or outside vendor who is to build the tool attempts to order some of the components or "so called standard parts," he is faced with the possibility of being advised that the item is no longer manufactured. In some cases, he is unable to locate a source at all. Having come to a complete dead end on material, the vendor is then obliged to contact the customer and obtain a clarification or complete engineering modification.

Same procedure would be necessary in the event the customer's own machine shop were building the tool. The resulting delays, while the necessary changes are effected and approved, can stretch into weeks weeks in which tool dollars and valuable production hours are being wasted needlessly.

Anticipated Buying

In conjunction with an up to date catalog library, the policy of "anticipated buying" by the engineering department saves weeks and sometimes months in tool deliveries. Briefly, this is how it works:

1. Tool designer finds it necessary to incorporate certain special purchased items (i.e., odd size hydraulic units, special clamps, special bushings) into the Bill of Material.
2. Using latest manuals and catalogs, he lists trade name, model number, and or dimensions required (the name of a local distributor often helps a Purchasing Department but is of no value if the tool is being built by a vendor in another area).
3. After tool design is checked and approved for shop use, requisitions for special items are prepared and forwarded to the buying group for immediate purchase.
4. Finished tool prints are sent to prospective vendors for quotations with notation that subject special items will be furnished to vendor.
5. Upon receipt, special items are forwarded to vendor who was awarded job. In many instances, supplier can be instructed to ship items directly to the vendor.

The above procedure would naturally vary according to company practices, but it can be seen clearly that the minimum time saving is two weeks (the average time between the request for quotation and the actual placing of the tool order). Generally, it will save considerably more time.

Multiple or Single Purpose

Wherever possible, multiple purpose tools should be designed. A milling fixture that can be used for five milling operations instead of one operation may cost 200 per cent more originally, but it would cost 100 per cent more to build four additional fixtures.

Remember, every additional tool must include the certain basic costs in starting a job through the shop. Two individual tools will invariably cost more than one tool performing in two operations.

Keep Them Clean

Over the years there has been a tendency in some engineering departments ostensibly to lower cost by laying out a complicated tool in its entirety on one sheet of drawing paper rather than placing the assembly drawing on one sheet and the component details on subsequent sheets.

Any money this procedure might save on paper or blueprinting is more than offset by the number of direct labor hours involved in requiring shop personnel to make sketches so that various machined details can be run at the same time in different parts of the shop. When a tool maker or machine operator has to spend time trying to unscramble a crowded or over-complicated tool drawing, unproductive labor hours are being posted to the job.

Expensive Economy

Inexpensive tooling is not necessarily the most economical in the long run. Cost of tooling must be based on the production quantity requirements. For many short runs, cheaper tools might well suffice, provided that tolerances are not too "tight."

Cheap tooling for long production runs, however, is a criminal waste of money. The tools will not be durable and cannot be depended upon for quality. Constant replacement of supposedly nonperishable tools is expensive. Honest, intelligent appraisal of tool requirements prior to the actual tool designing will eliminate headaches on the production line.

TOOL AND DIE MATERIALS

FORUM

CARL BERNDT
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Cost-conscious users are imposing new requirements. Chemical and physical properties once considered insignificant are being stressed. Notable gains, for example, are being made in higher-alloy, high-physical property steels. Economy picture is rounded out by new plastics for tools, dies, jigs, fixtures, gages, patterns, locating blocks, for example

CARL BERNDT

Graphitic Tool Steels Gain Friends Among Users of Cold-work Materials

TODAY'S big news in cold work tool and die materials is the tremendous increase in use and popularity of graphitic tool steels.

Free graphite included in the structure imparts special properties useful in a large number of applications. A carefully-controlled chemical composition makes possible the precipitation of graphite from the total carbon content during mill processing. The structure with included graphite has free machining qualities, high resistance to wear and good anti-frictional properties. Compared to the tool steels, there is less tendency for pick-up and scoring.

Graph-Mo, a Timken product, is an oil-hardening grade that could be called an all-purpose tool steel. Owing to its free-machining qualities, it can be fabricated into finished tools quicker, and its resistance to abrasion, galling, scuffing and scoring greatly reduces downtime on production lines. It can be metallic arc-welded without fear of cracking.

In several large automotive plants, it is being used on blank, form, trim, flange, draw and restrike dies. It has also given exceptional results on wear and heel plates, and has added service life to piercing punches and button dies.

Graph-Mo is available in hollow bars that offer the advantages of reduced machining time and less scrap loss on ring-shaped parts. A large range of sizes is carried in stock.

K. R. BEARDSLEE

Sees Time When New Carbide Grades Will Demand Better Machines

MACHINE tools are doing an outstanding job with cutting tool carbide grades. In fact, machine tool horsepower has more than caught up with the carbides.

In three or four years, we expect the picture to change. Development of new carbide grades like our 300 series that has a tougher grain structure and can withstand

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higher cutting temperatures at the point of cutting will demand more horsepower from machines.

But tougher grades of cemented carbide tools will bring up problems. The development engineer, for example, will be faced with the task of adapting them to many machines.

As tougher carbides allow faster and deeper cuts, it is possible an advanced method of mechanically clamping blanks or a radically different method of joining must be found. Terrific heat will be generated at the cutting tool edge.

These carbides of the future will play an important part in furthering cold heading and die operations because of their wear resistance. They also will contribute to better hot and cold extrusion methods and the production of solid-carbide pieces up to 1000 pounds.

Some chrome carbides for hot extruding already are giving good results with several nonferrous metals. Carbides under development promise better performance.

In the die field, we foresee wider usage of carbides in spite of newer materials, larger, beefed-up presses, heavier work loads and larger work pieces.

In blanking and stamping operations, for example, we expect the use of carbides to widen considerably because of techniques developed to form carbide pieces with closer tolerances.

G. V. LUERSSEN

Search for Ways to Stretch Dollars Is Never-ending Quest of Industry

THE METALWORKING industry is definitely not a static business. Alert leaders in every plant and shop are constantly searching for methods of reducing costs and stretching dollars.

Proper tooling is one of the important factors in achieving this objective. Carpenter keeps its research laboratories constantly at work developing new alloy combinations with new properties.

An example of the improved steels springing from this research program is Carpenter Vega, an air-hardening die steel. Analysis was developed to meet the need for a steel having all the advantages of the non-deforming properties inherent in an air-hardening steel, without the disadvantage of high temperature hardening usually associated with them. Experience in many applications has indicated great savings in both tooling and production costs.

Still the research for better steels and fabricating techniques continues. It is a most encouraging sign for the industry, and one more example of the American competitive enterprise system in operation.

E. J. REITLER

Suppliers' Know-how and Techniques Can Give Material Plus Properties

PROCESSING techniques can be the backbone of a product. In the making of preformed sections of carbide, for example, the method of pressing is important.

We use Hydrostatic Pressing. A tungsten carbide powder is placed in rubber balloons and pressed under water. Since water will not compress, more uniform forces are exerted in every direction. As a result, a much more uniform shrinkage is built into the product.

This method of pressing also provides a much more porous-free product. It has been contended that dirt and foreign matter were the chief causes of porosity in carbide. This is true, but we also maintain that proper pressing can do a lot toward creating a much more dense material.

With this method of pressing, we also have practically doubled the transverse rupture strength of our material, to combine the ultimate in strength and wearability.

H. J. RENAUD

Both Money and Time Can Be Saved Using Plastic Dies for Tryouts

WISE USE of plastic materials can pay off in substantial savings in time and money. They are particularly attractive for die development, such as short-run, forming dies, drop hammer, hydro-form and some types of blanking dies. Breakdowns that would amount to a crisis with hard dies require only minor repair on plastic dies. Tryout time should not be over 20 hours for a die of any size or shape.

With properly constructed plastic dies complete plas-

be and no metal weldments), extreme draws can be made readily. Apparently, the insulating characteristics of the plastic cause heat retention in the die and sheet metal stock. Heat is generated by molecular friction within the draw stock.

A laminate shell should be free of voids. All sharp corners and radii should be reinforced with glass cloth extending to the surface coat. Cast backup material for laminate shell must be shrink and void free and have good bonding qualities.

A recent development is the Ren-ite, modified-epoxy, die surface coat material. It is for dies or other tools where abrasion resistance, wear and hard surfaces are required. Material has abrasion resistance about ten times greater than hot-rolled steel.

Another Ren-ite, modified-epoxy casting material still under development will cure out with considerable toughness. It is for draw dies, hammer form blocks, wedge blocks and other tools where toughness, rather than rigidity and hardness, is required. It will withstand sharp blows and severe impact.

G. A. ROBERTS

Role Played by Sulphur in Steels Is Being Widely Investigated

TOOL and die steels are an ever-changing segment of the alloy steel industry, and 1954 will see no exception to this tradition.

High-speed steels with high-sulphur content and high-carbon, high-chromium steels containing sulphur are being widely tested and investigated by the consuming industry. Two of the latter type, Crocar FM and Ohio Die FM, produced by Vanadium-Alloys Steel Co., have been in use for certain types of saws and shearing tools over 15 years.

Experimental introduction of sulphur into high-speed steel (1920 to 1940) has been expanded to production quantities. Saving is chiefly related to the improved finish. There is no need for special pretreatment of tools generally made from high-speed steel forgings, such as milling cutters and hobs.

Improvement in machinability itself (faster cutting speeds) may be advantageous, but it is too early to tell. Most reports indicate no improvement in performance; but with proper application, there is little reason to suspect that increased brittleness caused by sulphur additions (however properly dispersed) will reduce tool life.

The tool and die industry is becoming increasingly interested in the application of better materials for cold working dies. In keeping are the continued punch and die applications of high-vanadium, high-speed steels given standard or special heat treatment. New and improved hot-work die materials also have been developed for extrusion dies and coining operations.

A. T. CLARAGE

Thinks Users Will Continue Trend Toward Quality, Predictability

THE YEAR 1953 saw further evolution in the tool steel field, and 1954 holds promise of more gains.

Increased use of the higher-alloy, higher-physical property steels last year was of note. While tool steel sales were slightly below 1952's, sales of the high-speed and hot-work steels gained. To a lesser extent, in the high-carbon, high-chrome field, there was a trend toward non-deforming and shock-resisting groups.

Variations in chemistry made their appearance during the year. Most of them represented higher alloy content for increased physical properties. They didn't reach a substantial portion in the market but were sought by and reported of value, and indicate trend. Some interest also is shown in added ingredients, such as rare-earth additives for grain control and forgeability and nonferrous additives for easier machinability of the tool steel itself.

Probably the greatest gains from the users' standpoint were new standards of microscopic cleanliness in steel and almost perfect control of segregate dispersion. Residual impurities have been reduced to new lows. Tool steel generally has reached new highs in predictability.

Another trend is the large proportion of tool steel being hardened and tempered by professional heat-treaters.

As to the future, it looks like further steps in last year's direction. The specials, with new and higher alloy content, and the additive dopes, are expected to attract some attention. But with today's labor charges, importance of delivery schedules and freedom from downtime, the users' foremost interest seems to be on highest quality, uniformly-predictable tool steel.

H. E. REPLOGLE

User Takes Look at Shop, Materials In Drive to Reduce Expenses

PROBABLY the most important trend in the use of tool and die steels is the hard necessity of getting lower final costs. To this end we find most users re-examining their tooling practice and seeking improved materials.

A high-speed steel, Unicut, and a die steel, Sparta, are contributing toward higher production at lower over-all tool costs. Type analysis of Unicut is C 1, Mn 0.25, Si 0.30, Cr 4, W 6.25, V 2.40, and Mo 6.25. Composition has above average edge strength at hardness values of Rockwell C 65.5 and higher. This, coupled with high abrasion resistance, has led to its rapid adoption for cutting tools where machining is difficult—particularly for broaches and form tools.

Sparta is C 1, Mn 0.65, Si 0.30, Cr 5, V 0.25, Mo 1.25. This air-hardening die steel (although widely accepted) is being discovered by many regular users of oil-hardening tool steel as markedly better than the older type. Superior in size change characteristics after heat treatment, it has greater strength and resistance to shock, plus much better wear resistance than the die steel it is replacing.

With tool-room costs at an all-time high, its use is reducing finish grinding time, and its greater wear life makes for lower resharpening costs.

L. V. KLAYBOR

New Alloys Are Easier to Handle And Offer Longer Tool Life

RECENT developments in tool and die steels are aimed at improved tool and die life and ease of tool and die manufacture. Broad range of alloys includes high-carbon, high-chromium die steels, high-speed steels, hot-work die steels and water-hardening steels.

In high-speed steels for special purposes, vanadium content has been increased from 2 to 3 to 5 per cent. Most common are M-3 (of the tungsten-moly group) and T-15 (of the tungsten steels). Latter has 5 per cent vanadium and 5 per cent cobalt. Their chief applications are single point cutting tools, form tools, counterbores, broaches and hobs on hard material.

Considerable interest is shown in the free-machining properties of high-speed steels containing 0.10 to 0.16 per cent sulphur and high-carbon, chromium steels containing 0.10 to 0.14 per cent sulphur. Effect of sulphur on tool life has not been completely evaluated.

A high-carbon, high-vanadium steel has eliminated galling and scoring in forming metals by deep drawing. It is used widely as a die for forming any ferrous alloy.

Improved wear resistance of the straight-carbon, water-hardening steels is obtained with additions of 1 to 1½ per cent tungsten and 1 to 1½ per cent cobalt to standard, water-hardening steel. Alloy has increased life of cold-heading dies up to 100 per cent.

An alloy for hot-work dies that maintains better high-temperature properties than 9 per cent tungsten, hot-work steel has been developed. It also has better impact properties and higher wear resistance at elevated temperatures. Steel has improved tool life for brass extrusion tools, hot punches and dies for extrusion of valves.

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Voices Need for Standardization Of the Carbide Grades

WE anticipate further growth of cemented carbides for cutting tools, dies and wear parts and cast alloys (of cobalt, chromium, tungsten, tantalum, carbon, columbium, etc.) for cutting tools, wear parts and resistance to chemical and corrosive attack.

Carbide development has not reached the standardization of high-speed steels, but through the efforts of large users and manufacturers, there is a trend in that direction. Last year a significant step was taken by the formulation of a carbide standardization committee section of ASTE, working in co-operation with ASME and ASM.

At one time we were of the opinion that cast cutting alloys (of the Tantung and Stellite types) gave a good account of themselves only where machine tools did not have sufficient speed, power or rigidity to use carbide tools successfully. It appears now that we may have underestimated them.

A case in point involves dies for drawing figure 8 trolley wire. Wire was formerly drawn in fragile and expensive carbide dies. We suggested replaceable nibs of cast Tantung, expecting lower production per nib but an over-all economy because the new material cost only 10 per cent as much as the carbide. However, in many instances, the Tantung nibs performed as well or better than the carbide.

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Flat Ground Die Steels Offer Way To Trim Machining Costs

FLAT ground, die steel offers savings in time and labor. Instead of spending hours milling, planing and grinding

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to prepare the raw bar, the die maker using this material can begin work where his skill is best utilized.

Simonds has two basic steels to satisfy majority requirements. They are nondeforming types of tool steel: a manganese-molybdenum, oil-hardening grade and a chromium-molybdenum-vanadium, air-hardening grade. Both have 100 per cent spheroidized, full-annealed microstructure that combines excellent machinability and uniform response to heat treatment.

Oil-hardening grade is particularly suitable for the smaller tool, die and machine shops. It can be heat treated over a wide hardening range. Where better wear resistance is needed for long production runs or the application is more critical, the air-hardening grade is indicated.

Improved grinding techniques make it possible to mass produce ready-to-use die steel to closer tolerances, smoother finish and greater uniformity than generally attained in average shops. Thickness is held to +.0001 inch. Surface finish is maintained at 25 to 35 micro inches.

Standard-size bars, in flats and squares, are generally available from local stocks in industrial supply houses and tool steel warehouses. Off-the-shelf sizes range from $\frac{1}{4}$ to 3 inches thick and $\frac{1}{8}$ to 11 inches wide in standard 18-inch lengths. (Mr. Simonds is president of the Simonds Saw & Steel Co., Fitchburg, Mass.)

J. Y. RIEDEL

Air-hardening Tool Steel Excells Where Heat Treatment Is Desired

AIR HARDENING types of tool steel have firmly established themselves in the last 15 years.

Air-quenched tools never crack in heat treatment. Because they lack sensitivity to possible cracking during hardening, tools of complicated designs can be produced — designs that would be impractical if liquid quenching were required. And, compared to liquid quenching, size changes in tool dimensions are much less during hardening by air quenching.

Wide use of two types of air-hardening tool steel is recognized by SAE classification. SAE type A2 contains 1 per cent C and 5 per cent Cr. SAE type D2 contains 1.5 per cent C and 12 per cent Cr and will be recognized as high-carbon, high-chromium type. Both give excellent performance when properly applied. They are not suited to shock-resisting applications.

Bethlehem has developed an air-hardening, shock-resisting steel that fills the need where D2 and A2 types are not suitable. Known by the trade name, "Bearcat," its typical composition is 0.50 C, 3.25 Cr and 1.40 Mo.

"Bearcat" offers: Maximum shock-resistance, air hardening, low distortion in heat-treatment, deep-hardening, easy machinability (Brinell 197 max), good hot-work properties and is easy to carburize.

Primarily a shock steel, it is a good choice for any shock job where wearing conditions are not extreme. Some typical uses are rivet sets, punches, blanking and forming dies, hot headers, gripper dies, short-run dies, mock and hub or point, chisels, master hobs, machined-cavity molds and die-casting molds.

F. B. RACKLEY

Now Users Are Challenging Suppliers To Upgrade Quality, Efficiency

WE believe the tool and die industry is facing a challenge thrown down by its customers. The battle cry is "quality and efficiency."

Importance being given to efficiency (the cost factor) in today's competitive market is reflected in the increased demand for ground flat stock, both oil hardening and air hardening.

In the manufacture of dies, gages, verniers, etc., cost-conscious management has found that paying a little more for finished stock is more than compensated for by elimination of preliminary machining. This is but one example of how we are meeting the trend.

Purple Label (C 0.71, Cr 4.20, V 1.10, W 18, Mo 0.75 max, Co 5) is our 18-4-1, plus 5 per cent cobalt, type of high-speed steel. In general, it's used for hogging cuts, rapid speeds and cutting hard, scaly and tough materials.

Dica B is an air-hardening, hot-work die steel especially suited for die casting aluminum-base alloys. Its analysis: C 0.35, Si 1, Cr 5, V 0.20, Mo 1.50.

Windsor is an air-hardening, hot-work die steel. C 1, Mn 0.50, Cr 5, Mo 1.25, V 0.30. Easily machined and nondeforming, it is for applications that require great abrasion resistance.

Truform is a general-purpose, oil-hardening, nonde-

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forming alloy tool steel for use where extreme accuracy is desired. Its analysis is the same as ground flat stock—C 0.90, Mn 1.20, Si 0.30, W 0.50, Cr 0.50. Applications include blanking dies, burnishing gears and drawing dies.

Numerous orders also are received for composite die sections. Here, expensive tool steel is inserted in a carbon-steel backing, where only a minimum of tool steel analysis is necessary.

C. T. FLETCHER

High-vanadium, High-carbon Classes Are Being Used Extensively

ADVANCED testing techniques and better mill inspection have had a lot to do with the marked quality improvements in many tool steels the last several years. At the same time, application of tool steels has been steadily under-going important changes.

Significant trends are apparent in the use of high-speed steels. One is the growing use of high-vanadium, high-carbon classes, mostly based on M-2 composition. M-3 types, in particular, have been widely adopted. They are used extensively for broaches and form tools.

Another trend is the return to tungsten-cobalt grades for heavy-duty cutting tools. Free machining types of the molybdenum, high-speed steels also have been made available. They have high sulphur and may be useful where machinability is of prime importance.

Quite noticeable in cold-work steels is a tendency toward a shift from the oil-hardening type to the 5 per cent chromium (air hardening) and the high-carbon, high-chromium grades.

Much research and development is being done on hot-work steels. One new alloy (Congo Hot Work) is a high-cobalt, precipitation-hardening steel marketed by Braeburn Alloy Steel Corp. It has been used successfully for hobs in beryllium-copper, pressure casting and is under development for tooling in aluminum and brass extrusion, aluminum die casting and certain brass and steel forging operations.

Other new hot-work steels: A 6 Mo, 4 Cr, 1 W grade has been found especially suited for solid dummy blocks in brass extrusion. A 5 Cr, 5 W grade is making a good showing in mandrels for brass and aluminum extrusion.

H. M. GIVENS JR.

Fabrication of Ring-shaped Parts Is Faster with Hollow Bars

HOLLOW bars of tool steel are designed to speed the fabrication of ring-shaped parts traditionally cut from solid bars or special forgings. Stamping dies, can dies, liners, ring gages and trim dies are typical uses. Parts can be made cheaper because the fabricator by-passes high cost machining of central areas.

Crucible's hollow, tool-steel bars have a prior machined surface and hole. Five of its tool steels are available from stock as hollow bars. Grades are Sanderson, water-hardening tool steel; Ketos, oil-hardening tool steel; Airkool, air-hardening tool steel; NuDie V, hot-work tool steel; and Airdi 150, high-carbon, high-chromium tool steel. Although other grades are available on mill delivery, these are designed to meet the majority of tool and die applications.

Sanderson is a high-carbon, special-quality tool steel for applications requiring case and core characteristics. Ketos is a general-purpose, chrome-tungsten alloy tool steel for applications needing less distortion and heat treatment than could be tolerated with water-hardening tool steel.

Airkool is a 5 per cent, chrome-molybdenum-vanadium die steel. It has high toughness, good resistance to wear and minimum distortion in heat treatment. NuDie V is an air-hardening, low-carbon tool steel used for tools and dies subject to heat. Airdi 150 is used for maximum resistance to wear and size change. Warehouse stocks range from 2-inch Rd with a 1-inch hole to 16-inch Rd with a 12-inch hole.

F. L. BOGART

Low Fabrication and Finishing Costs Are Key to Plastic Tools, Dies

IN THE PAST, low fabrication cost of plastic dies was frequently offset by the need to repair and service tools that would not stand up under abrasion for a long production run. Dies for large panels often needed servicing after every thousand panels or so. Repairs took a

matter of minutes, but they called for a skilled workman.

A phenolic casting material with good strength is resin No. 78, product of the Marblette Corp. Exceptionally stable, it has a shrinkage rate of about 0.0005 inch per inch; impact and compressive strengths are 25 to 50 per cent better than previous phenolics.

The resin was primarily developed for cast tools that obtain higher impact strength by being constructed with a laminated skin filled with cast phenolic.

Average cost of plastic tooling is about 50 per cent cheaper than other types. Saving is not in the cost of the material, which is about the same as steel on a per-cubic-foot basis. Economies stem from the elimination of expensive equipment for fabrication and labor costs connected with finishing. Tools with much contour offer largest savings.

An example of a successful experimental draw die was made with resin No. 78 by Rizzo Bros. Engineering and Mfg. Co., Detroit. It ran 1200 panels of 0.033 cold-rolled steel with no sign of wear. A restrike die to form depressions in a ridge on the part ran 150 panels. After an impression worn in the tool by severe gouging was cold-patched, it stood up for 150 more panels. Steel inserts were embedded at the point of severe wear, and the remainder of the 1200-panel run was trouble free. Two tools could run in excess of 20,000 panels before further service.

D. J. GILES

Self-lubricating, Free-machining Steels Attract Attention

SINCE the close of World War II, steady progress has been made in the development and application of new and improved steel compositions for all types of tools and dies.

They include: Molybdenum-base, high-speed steels, super-high-speed and abrasion-resisting die steels (containing high carbon and vanadium) and precipitation-hardening die steels for specialized work.

Development of improved steel manufacturing techniques has resulted in much more uniform quality tool steels of conventional composition, leading to better properties and top performance. This was brought about by positive control of carbide segregation, pioneered by Latrobe Steel Co.

Recently announced self-lubricated, high-speed steels and free-machining, high-carbon, high-chromium die steels are attracting a lot of attention.

Marked increase in tool life of self-lubricated steels is especially vital. Steels themselves are of conventional analyses, except for the special sulphide additives. They give needed lubricity at the cutting edges. Improvements are reported to range from a few to several hundred per cent, depending on the type of tool.

High-carbon, high-chromium steel dies with sulphide additives are easier to fabricate because of vastly improved machinability. Other properties are unimpaired; impact strengths and heat treatment are the same, and there is evidence of improved die life.

W. L. KENNICOTT

Designers of Carbide Cutting Tools Become Maintenance Conscious

SWING to tool designs that need less maintenance is the outstanding trend of the past year in carbide cutting tool usage.

W. L. KENNICOTT
Chief Engineer
Kennametal, Inc.
Latrobe, Pa.

Consistent high performance results from unstrained assemblies of well-proportioned, cutting inserts mounted in rugged, heat-treated steel holders. Major cutting forces are transmitted to the holder's solid surfaces without straining the clamping or holding device. Assemblies allow full use of the cutting insert's properties, harder carbide grades, higher operating speeds and heavier feeds.

Indexable inserts that accurately repeat minimize downtime while changing cutting edges. Precision factory-ground carbide rounds or prisms, which bring the cutting point to within 0.001-inch of the same position when indexed or replaced, are commonly used—closer controls are available when required. Inserts eliminate resetting of stops and reduce tool changing downtime to a fraction of that usually required.

Cylindrical, square, triangular and diamond prisms can be reground simply on the ends only after all positions are dulled, providing six to 14 fresh cutting edges, in about the same grinding time previously needed to recondition a single tool. Nose radius, point and edge are automatically controlled. Likelihood of damage in grinding is greatly reduced.

Examples of progressive thinking in metal cutting tool design emphasize three advantages: Unstrained assemblies for improved cutting performance, indexable, quick-change cutting inserts for minimum downtime and simplified regrinding (or no regrinding) for reduced maintenance costs.

DALE KNEPP

Plastic Research and Development Aimed at Improved Physicals

EPOXY resin tools reinforced with fiber glass are widely used for jigs, fixtures and mastering applications with excellent results.

But laminate construction has limitations—delamination under compression and impact, high labor cost for large masses and variations in physical properties caused by air voids, cloth bridging and inconsistent wetting. Kish Resin has developed epoxy casting resins and application techniques with an eye to overcoming these difficulties.

With new epoxy backup resin, large masses may be

Give productivity a lift! ...wherever there's a lifting job

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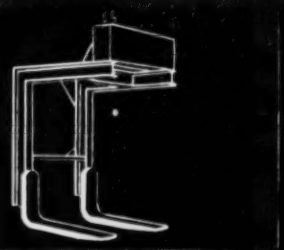
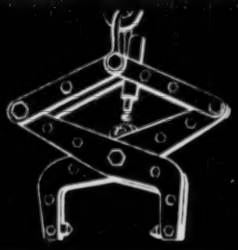
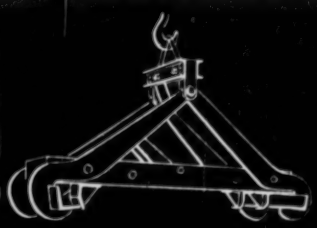


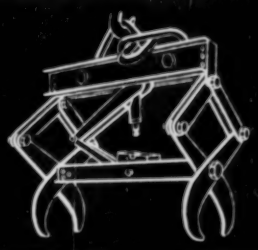
"C" hook for lifting pallets



Tong for stripping an ingot



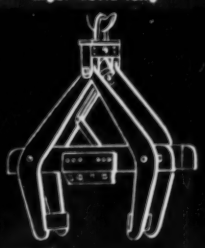
Tongs for lifting scrap boxes



Spreader type tongs for lifting round

ble "C" hook for plate or flat objects

Ingot mould tong



Tongs for lifting groups of rounds

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Vice President of Sales
Firth Sterling, Inc.
Pittsburgh

cast with low exotherm, excellent stability and physical properties. Resin is poured at room temperature and oven-cured.

Three surface-casting resin formulations range from an extremely hard surface to a resilient one comparable to a rubber tire. They may be applied to wood, metals and other plastics from ¼ to 1 inch thick, depending on the backup structure. Pouring and curing are at room temperature. Mold shrinkage is from 0.0001 to 0.0004 per inch. Adhesion and stability are excellent.

With epoxy core resin, large light-weight dies may be cast without shrink patterns. All plastic construction eliminates the differences of expansion and contraction in composite constructions of metal and plastic.

Kirksite and lead drop-hammer dies have been surfaced with cast, epoxy, surface resins for long production runs of aluminum and stainless panels. Surface of rigid plastic ¼ to ½ inch thick is cast directly to a Kirksite backup from a plaster splash. To form the punch, a surface of resilient epoxy is cast from ¼ to ½ inch thick to a Kirksite or lead backup.

J. S. DISSTON JR.

Composites Team Up Best Features Of Two Metals for Tooling

COMPOSITE metals offer a way to combine the desired features of two different metals for better efficiency and lower cost. By integrally compositing tool steel and low-carbon steel, a machine knife is produced that has a hard cutting edge reinforced with a steel of necessary toughness.

Hard cutting edge is usually an insert of special tool steel. Backing material is usually low carbon or low-carbon alloy steel. Manufacturing begins with the reinforcing steel in the billet condition.

Success of hardening depends upon the skill with which the composite steel bar is preformed (when necessary) prior to heat-treating. Each metal has its own coefficient of thermal expansion. Preforming is done by heating and bending the bar flatwise and edgewise, to give the insert side a predetermined amount of convex shape in each direction.

Preformed bar is heat-treated for optimum mechanical and physical properties of the insert steel by quenching from the right hardening temperature and subsequent tempering. After heat treatment, the backing metal is tough and not materially hardened. Heat-treated bar is straightened and ground to size and shape. Drilling, tapping and slotting are done after hardening, to minimize hardening distortion.

This type of composite steel is used for paper, veneer, planer and other high-quality knives exposed to considerable abuse in service. They must have edge holding qualities equal to solid, tool steel. Knives range up to about 125 inches long, 10 inches wide and 1 inch thick.

T. G. BARNES

Chemical and Physical Properties Take on New Significance

THERE is no single significant basis for the selection of tool and die materials. Neither is there a material that combines maximum performance and economy for all applications.

But automation, the power age and the general desire of industry to produce more economically have imposed new requirements. Chemical and physical properties, regarded insignificant years ago, are being highlighted.

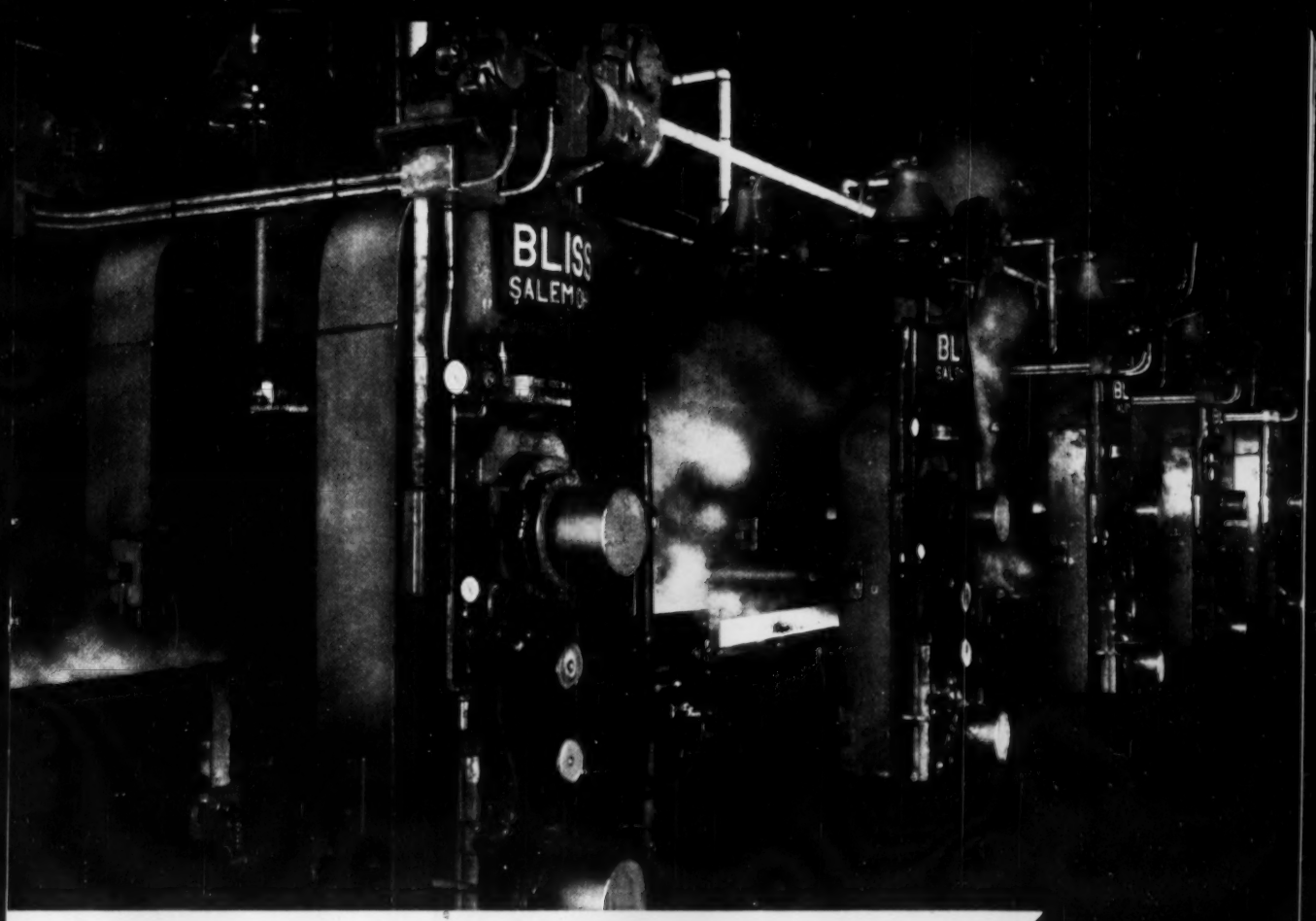
Chemical and physical properties at room temperature, for example, may no longer be a criteria of performance. Operating temperature must be given proper consideration. Hardness is not the sole contributor to wear resistance.

Less expensive tool steels, designed to satisfy conditions met by costlier steel containing large percentages of strategic materials, offer a few examples of how Firth Sterling is meeting the challenge.

Standard production items include carbides, such as chromium-carbide. It has resistance to chemical attack and oxidation, is lightweight, may be highly polished and has a coefficient of expansion similar to steel.

Titanium carbide and cermets lend themselves to hot-work and are extremely desirable when weight is a chief factor. They, too, are oxidation resistant—even to a higher temperature range than chromium-carbide.

Heavy alloys, such as Firth's heavy metal, combine high temperature hardness and strength. They have proved outstanding for forging and extrusion dies.



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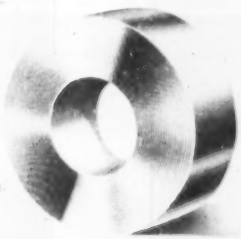

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CONFERENCE AND INDUSTRIAL EXPOSITION

PROGRAM
OF CONFERENCES

Convention Hall, Philadelphia—April 26-30, 1954

ASTE HEADQUARTERS ROOM—Independence Room—Benjamin Franklin Hotel

MONDAY, APRIL 26

1:30 p.m. Room 300
Convention Hall

Solutions to Problems in Producing Thin-Walled Parts

These fragile cylindrical parts with walls as thin as 0.004-inch that are tough to solder, braze or weld.

1a. Rolled Extrusion of Thin-Walled Parts (22T1). W. N. Parker, development engineer, RCA Victor Tube Division, Radio Corp. of America.

1b. (2:15) Rubber Clamping Assembly of Thin-Walled Parts (22T2). F. R. Simpson, director of research & development, Kuljian Corp.

1:30 p.m. Arena Conference Room
Convention Hall

What's New and Economical with Surface Cleaning

Especially where you need better surface finish control or you've got to get at difficult hidden surfaces.

2a. Surface Finish Control with Blast Cleaning (22T3). A. P. Neumann, chief engineer, Vapor Blast Mfg. Co.

2b. (2:15) Ultrasonic Techniques in Industrial Cleaning (22T4). Dr. W. L. McCracken, director of research, Detrex Corp.

3 p.m. Ballroom
Convention Hall

How to Take the "Bugs" Out of Your Production Planning and Control

Experts in the areas of management, planning and operations will answer questions on design and use of operations process sheets, flow charts, operating instruction sheets, machine loading schedules and scheduling, routing and dispatching operations and paperwork whether large or small plant and high or low production.

3. Production Planning and Control (Panel Discussion):
E. Kitzman, general superintendent, Link-Belt Co.
H. R. Murphy, planning department head, Grumman Aircraft Engineering Corp.
N. M. Perris, senior associate, Stevenson, Jordan & Harrison, Inc.
W. L. Tann, chief industrial planning engineer, Bureau of Ordnance, Navy Department.
C. Verkler, asst. manager of mfg., Caterpillar Tractor.
L. R. Weaver, manager of mfg. & eng., Westinghouse Electric Corp.

8 p.m. Ballroom
Bellevue-Stratford Hotel

How to Utilize and Develop Your Employees' Executive Potential

Giving them a bigger part in production planning and keeping the better men moving up the ladder. It pays big dividends.

4a. A Program for Developing Tool Engineers Into Manufacturing Executives (22T5). Dr. R. F. Pearse, senior associate, Worthington Associates, Inc.

4b. (9:00) Scalon Employee Relations Plan at Different Production Levels (22T6). E. M. Dowd, executive vice president, La Pointe Machine Tool Co.

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How to Spend Less on Actual Research and Yet Profit More From It

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NATIONAL SOCIETY FUNCTIONS

TUESDAY, APRIL 27

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Betsy Ross Room, Benjamin Franklin Hotel

9 a.m. House of Delegates Meeting
Crystal Ballroom, Benjamin Franklin Hotel

12 p.m. House of Delegates Luncheon
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Crystal Ballroom, Benjamin Franklin Hotel

12 p.m. Board of Directors Luncheon
Crystal Ballroom, Benjamin Franklin Hotel

7 p.m. Annual Meeting Banquet and Installation of National Officers
Ballroom, Bellevue-Stratford Hotel
(For Banquet reservations, at $7.50 per plate, send your check to ASTE Headquarters in Detroit.)

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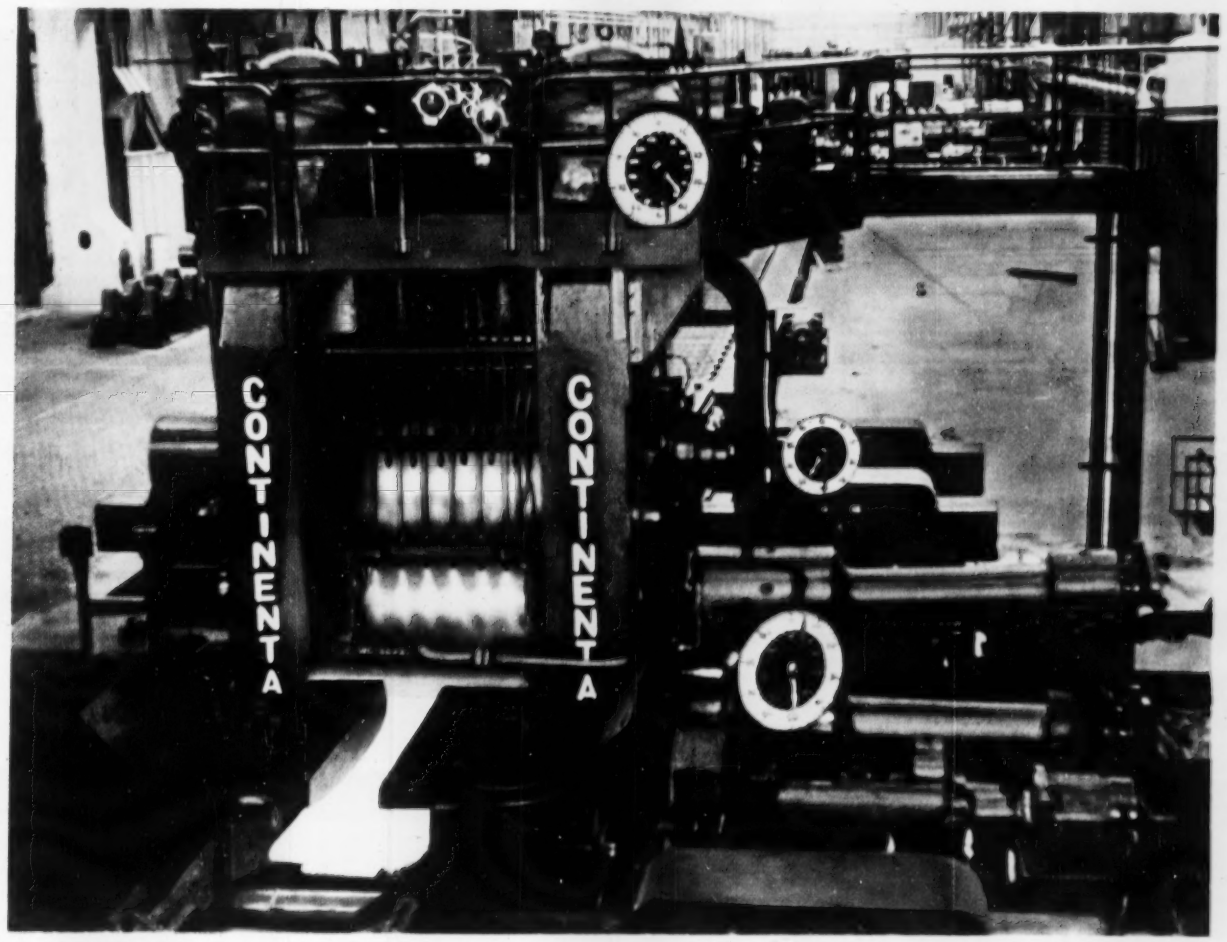
12 p.m. to 1 p.m. Educators — Engineers Luncheon and Conference
Poor Richard Room, Benjamin Franklin Hotel

CONTINENTAL

FOUR-HIGH REVERSING HOT MILL WITH VERTICAL EDGER



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CONTINENTAL
Foundry & Machine Company

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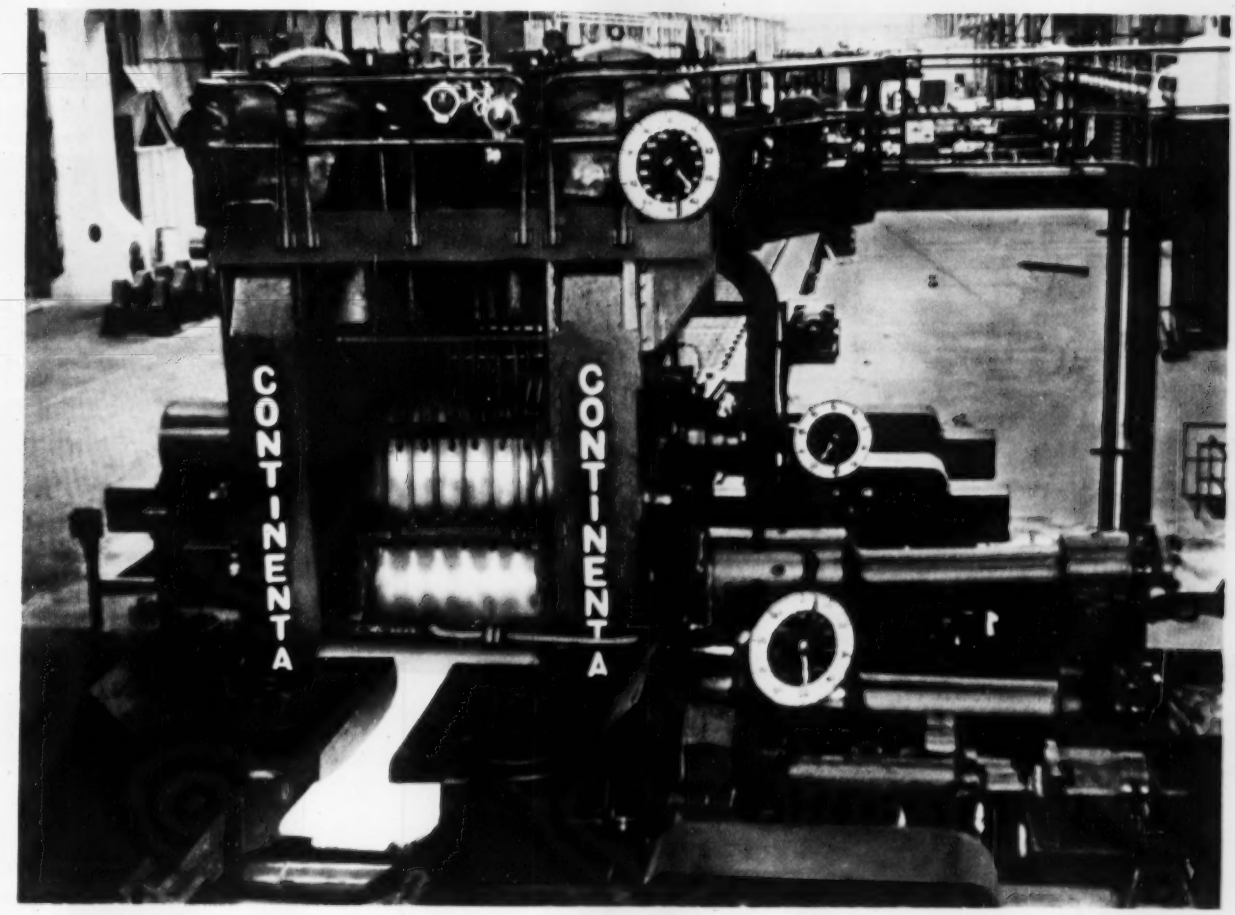

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CASTINGS carbon and alloy steel from 25 to 300,000 pounds

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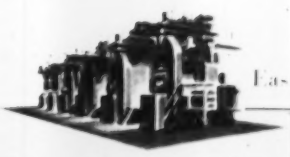

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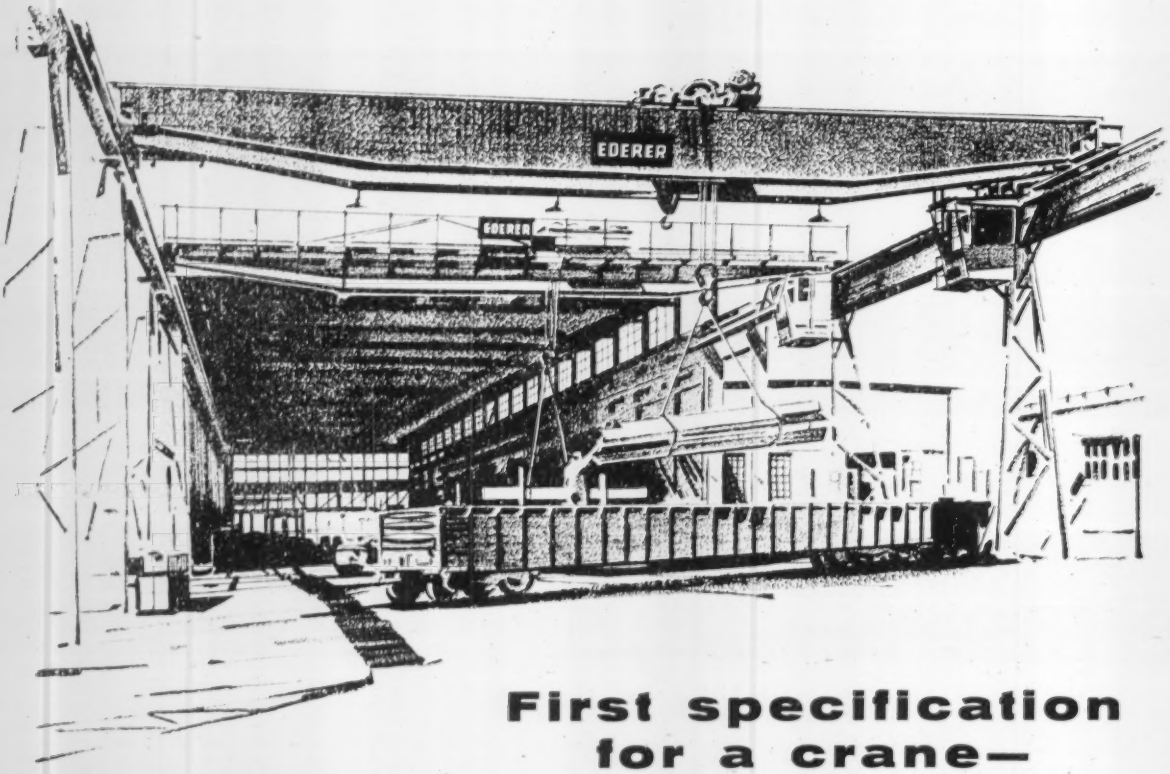
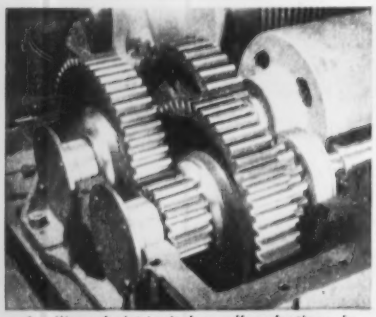
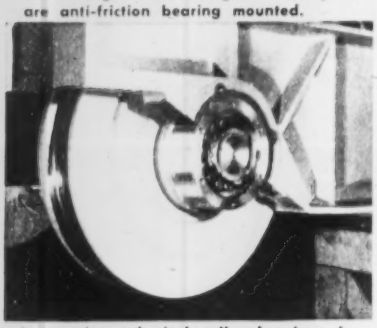


First specification for a crane— the job to be done



Auxiliary hoist unit has all reductions in one oil-tight case. All gears and quills are anti-friction bearing mounted.



Large size spherical roller bearings in MCB type wheel mounting; wheel and bearing easily removed. Rotating axle is coupled direct to bridge shaft drive.

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ASTE EXPOSITION

TUESDAY, APRIL 27

9 a.m. Arena Conference Room

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Quicker and More Automatic Ways of Holding All Work Materials

Whether they are ferrous or nonferrous . . . whether you want to make a few passes or produce 1,000,000 holes an hour.

6a. Magnetic Holding of Ferrous and Non-ferrous Materials (22T9)—J. F. Manting, president, Hanchett Magna-Lock Corp.

6b. (10:00) Jig Design for Multiple Automatic Operations (22T10)—F. G. Zagar, vice president and general manager, Zagar Tool Inc.

9 a.m. Room 300

Convention Hall

Advanced Developments in Induction Heating

How to keep metal temperatures under close control with reduced capital, tooling and power costs.

7a. Process Applications for Dual-Frequency Induction Heating (22T11)—R. S. Segsworth, director of research, General Engineering Co. Ltd.

7b. High-Production Tooling for Induction Heating (22T12)—P. N. Sorenson, chief test engineer, and G. E. Glick, production engineering manager, Tocco Division, Ohio Crankshaft Co.

1:30 p.m. Arena Conference Room

Convention Hall

How To Automatize Your Production with Special Machines

Whether it's complete machining of an engine block, producing a finished cigar or tieing a bow-tie without hands!

8a. How to Plan a Transfer Machine (22T13)—D. E. Hawkinson, vice president, Machine Tool Sales, Greenlee Bros. & Co.

8b. (2:15) Creativity in Mechanical Design (22T14)—H. A. Oldenkamp, director of engineering and L. Strauss, project manager, General Engineering Laboratories, American Machine & Foundry Co.

1:30 p.m Room 300

Convention Hall

Best Applications for Different Mechanical Assembly Techniques

How to join metallic or nonmetallic materials and elements more rapidly, with only moderately skilled labor and less expensive equipment.

9a. Changing Trends in Mechanical Fasteners (22T15)—W. C. Stewart, technical advisor, Industrial Fasteners Institute.

9b. (2:15) Fastening Techniques for Small Assemblies (22T16)—V. L. Bradford, vice president in charge of sales, Milford Rivet & Machine Co.

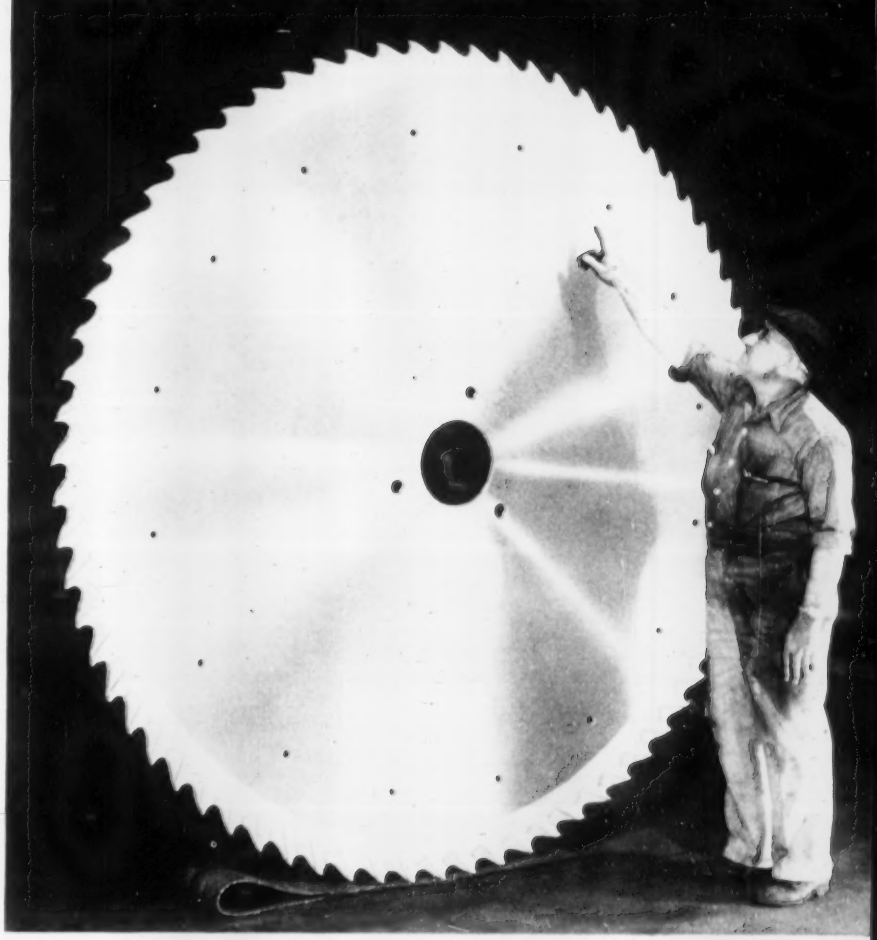
3 p.m. Ballroom

Convention Hall

The Why and How of Better Tooling for Automatics

There is almost always a better way to do it, whether on screw machines, turret lathes, or single or multi-spindle automatics. If you want to improve your production tooling, let this panel help. It has both the equipment and the manufacturing know-how.

LARGE or SMALL we make 'em all!



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...SEGMENTAL OR SOLID TOOTH...AND GET:

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. . . and for your smaller jobs, for slitting and milling, your best choice is Atkins Solid Tooth Metal-Cutting Saws. They're *Silver Steel*, of course, with a tooth shape for every job . . . and *Curled Chip* cutting for fast, free feeding and cleaner, truer cuts every time!

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ATKINS Silver Steel SAWS

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B-W

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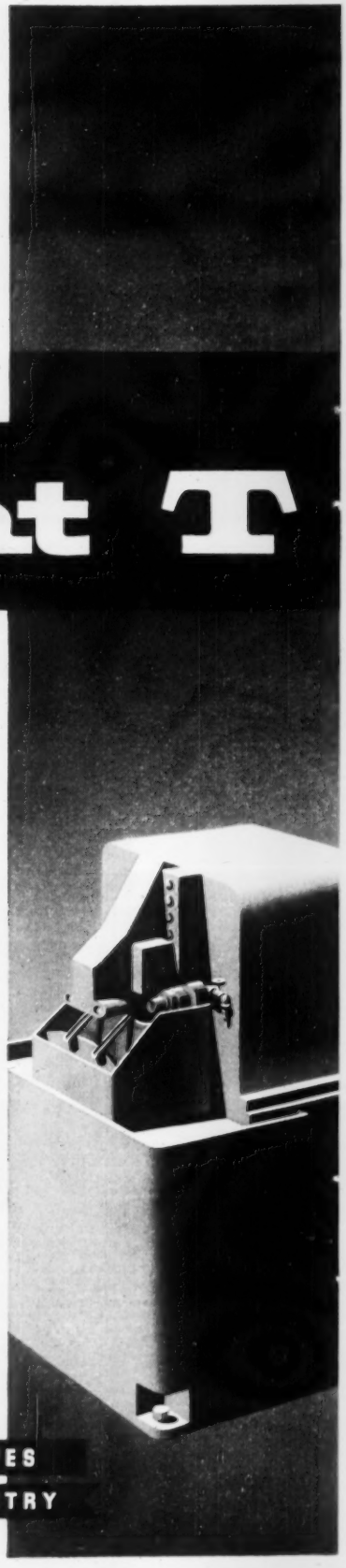
ship or store machinery?

Here's important news

Oilcoat T

prevents rust in lubricating systems
but does not contaminate lubricating oils



The compatibility of Gulf Oilcoat T with lubricating oils is of particular importance to you if the lubricating systems of your new machines are flushed with the same oil that is to be used for lubrication.

The use of a rust preventive that is not compatible may result in the development of harmful precipitates in the lubricating oil and considerably shorten its period of usefulness. Oils so contaminated may even cause machine parts to be damaged, thus increasing maintenance costs.

Several large machinery manufacturers have thoroughly tested Gulf Oilcoat T. They now use it extensively to protect the vital lubricating systems of their equipment against rust during shipment and installation.

Because of its light viscosity, Gulf Oilcoat T may be applied by spray, brush, dipping, or circulation.

If you manufacture, ship, store, or seasonally shut down machinery that has a lubricating system, ask a Gulf Sales Engineer to explain in more detail the advantages of Gulf Oilcoat T. Contact your nearest Gulf office now, or send the coupon below.

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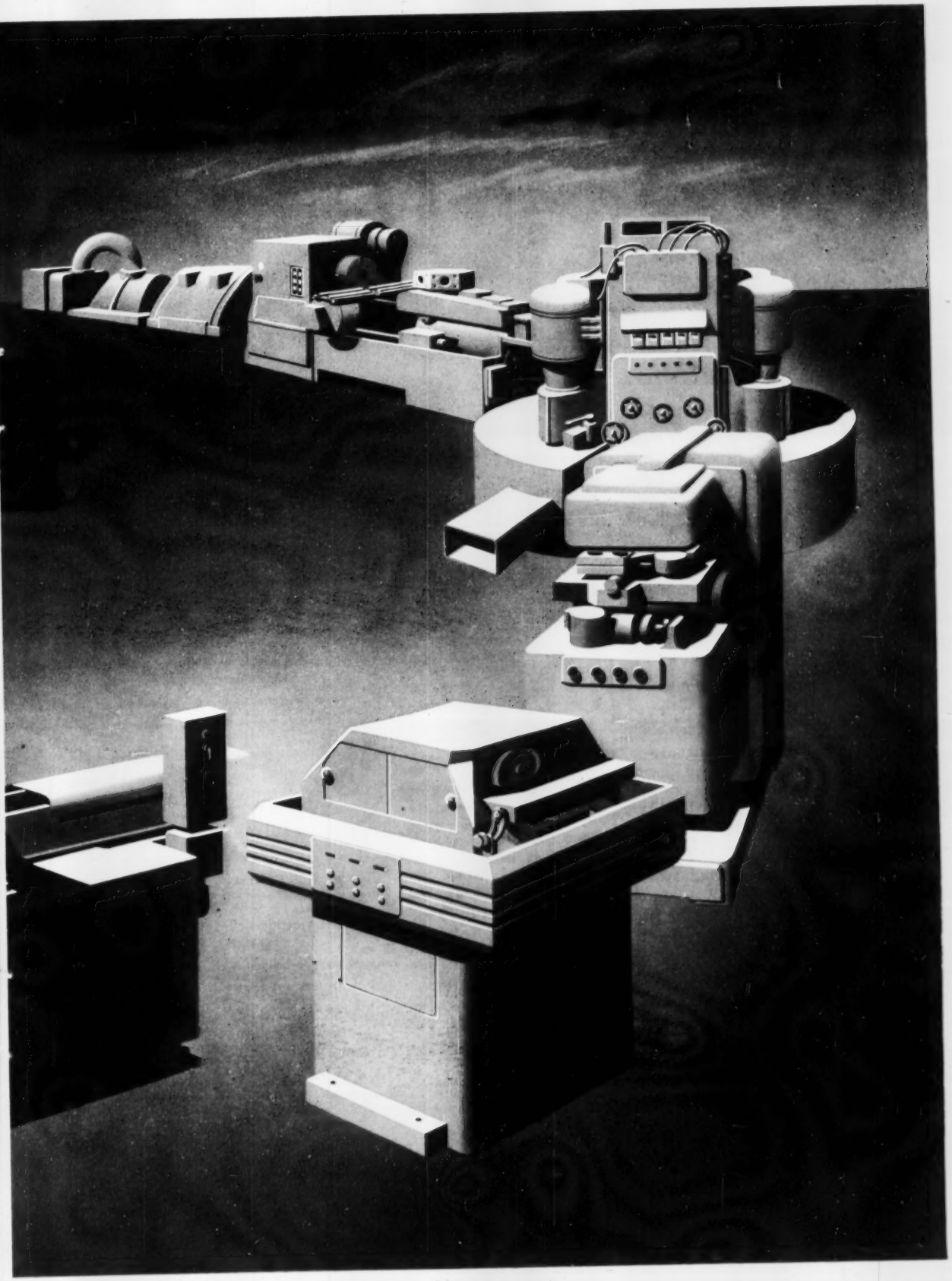


...How about Malleable?

Reduce Machining Time and Cost
Increase Product Durability

Malleable iron machines easier than any other ferrous metal of comparable strength and toughness. It can be cast into intricate shapes close to final form, greatly reducing machining. Malleable often can be further formed by press or coining operations and holes punched instead of drilled.

Take advantage of malleable's machinability, ductility, resistance to shock and corrosion when designing new products or looking for ways to cut costs on current production. Call a malleable foundry and go over your products with their engineers. Find out how malleable can improve your products and save money.

Automotive Differential Case

Because of malleable's remarkable machinability the $7\frac{5}{8}$" flange on this casting is turned at a rate of more than 125 parts per hour. Carbide tools are used with water as a coolant. Tool life averages 18 to 20 hours per grind.

Send for "Malleable Iron Facts" useful information on Malleable iron properties and uses. Just write to . . .

Malleable FOUNDERS' SOCIETY

1200 Union Commerce Building — Cleveland 14, Ohio

ASTE EXPOSITION

10. Tooling for Automatics

(Panel Discussion):

J. L. Anderson, chief tool estimator
Gisholt Machine Co.
J. S. Bruzek, supt., Tooling Division
Sargent & Co.
E. L. Ketter
Jacobs Mfg. Co.
F. J. McArthur, chief tool engineer
James & Lamson Machine Co.
T. H. Olson, chief tool engineer
Yale & Towne Mfg. Co.
J. Prohaska, vice president
Cleveland Automatic Machine Co.
W. H. Spence, sales director
Brown & Sharpe Mfg. Co.

8 p.m. Ballroom

Bellevue-Stratford Hotel

New Techniques and Possibilities for Castings

When can castings replace forgings for stressed structures? What about shell molding for small-scale as well as large-scale, automatic equipment?

11a. The Possibilities for Castings in Airframe Design (22T17)—A. H. Petersen, design group engineer, Lockheed Aircraft Corp.

11b. (9:00) Automation of Shell Molding (22T18)—L. J. Bishop, vice president and director of engineering, Mechanical Handling Systems Inc.

8 p.m. Burgundy Room

Bellevue-Stratford Hotel

Industrial Penetration of Atomic-Fission Discoveries

Possibilities of atomic by-products in wear studies of tools, dies, gears and bearings . . . the detection of incredibly minute amounts of undesired elements in metals . . . plant production control through use of depth and thickness gages . . . non-destructive testing . . . locating of raw materials such as piped liquids and plant effluents

12. Nucleonics Invade the Tool Engineering Field (22T19)—L. S. Goldring, radiochemist, Nuclear Development Associates Inc.

WEDNESDAY, APRIL 28

9 a.m. Ballroom

Convention Hall

Best Approaches to Internal Milling and Jigless Boring

Pantographic milling is now available with single or multiple-spindles, with two or three-dimensional tracers, at speeds to 45,000 rpm. Ultra-maintained precision demands removal of manual variables; automatic work positioning and tool lock and release help achieve this end.

13a. Tracer-Controlled Pantographic Milling (22T20)—A. L. Gunderson, assistant chief engineer, George Gorton Machine Co.

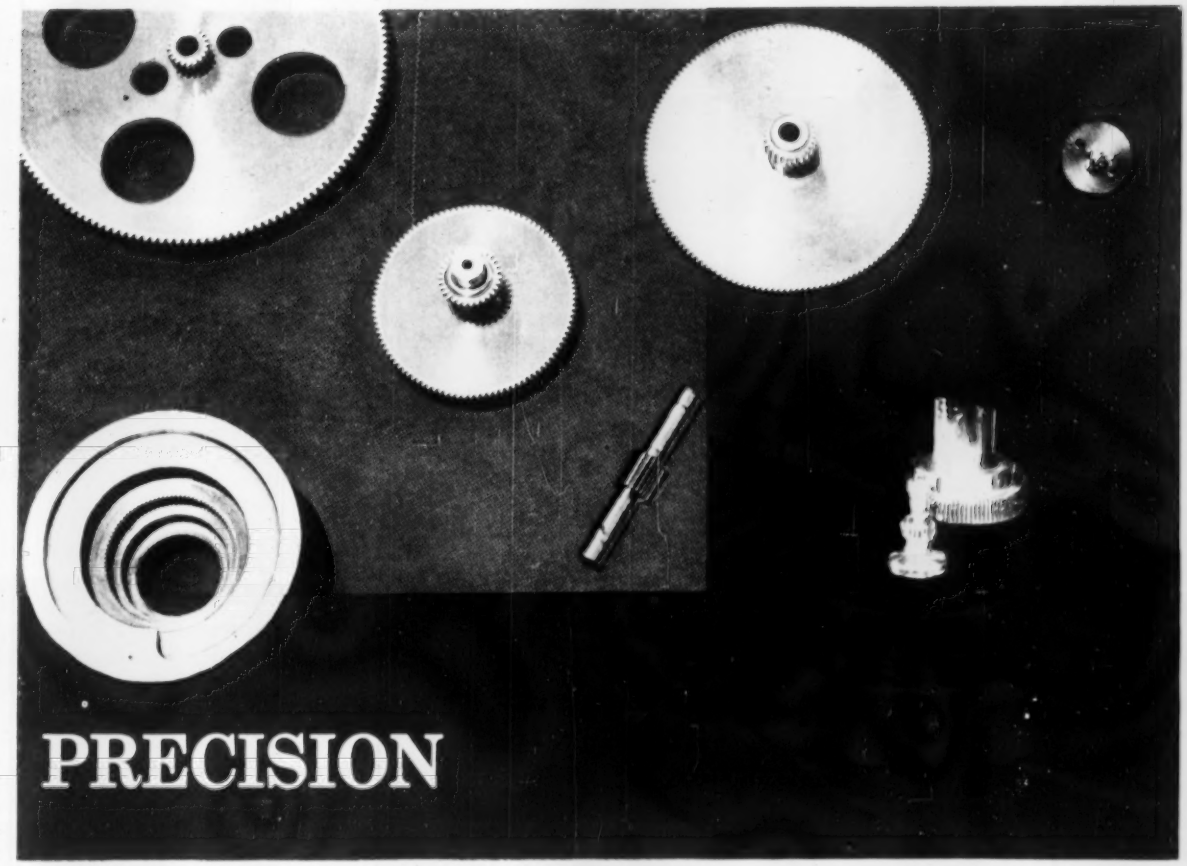
13b. (10:00) New Aids in Jigless Boring (22T21)—C. B. DeVlieg, president, DeVlieg Machine Co.

9 a.m. Room 300

Convention Hall

How to Prepare For and Secure Superior Metal Surfaces

Either by heating parts in special powder compounds . . . or by metal blasting for subsequent finishing. In the latter case, much versatility is achieved through use of the proper metallic or nonmetallic abrasive



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. . . at Low Cost

Fellows 3-Inch Fine-Pitch Gear Shaper

Fellows No. 4 Fine-Pitch Gear Shaving Machine

Small Gears, too, can be economically produced on Fellows equipment. The accuracy demands for tiny gears and pinions for the 'electronic age' are being met with tolerances in the low tenths of a thousandth of an inch (that's .0002" for example).

The proof is in the production records of the machines shown at left, used with Original Fellows Cutters and Shaving Tools. We'll be glad to quote some outstanding examples on small gears similar to your requirements. There's a Fellows Representative with the facts at the sales office near you.

For Absolute Quality Control Tool up with Original Fellows Cutters

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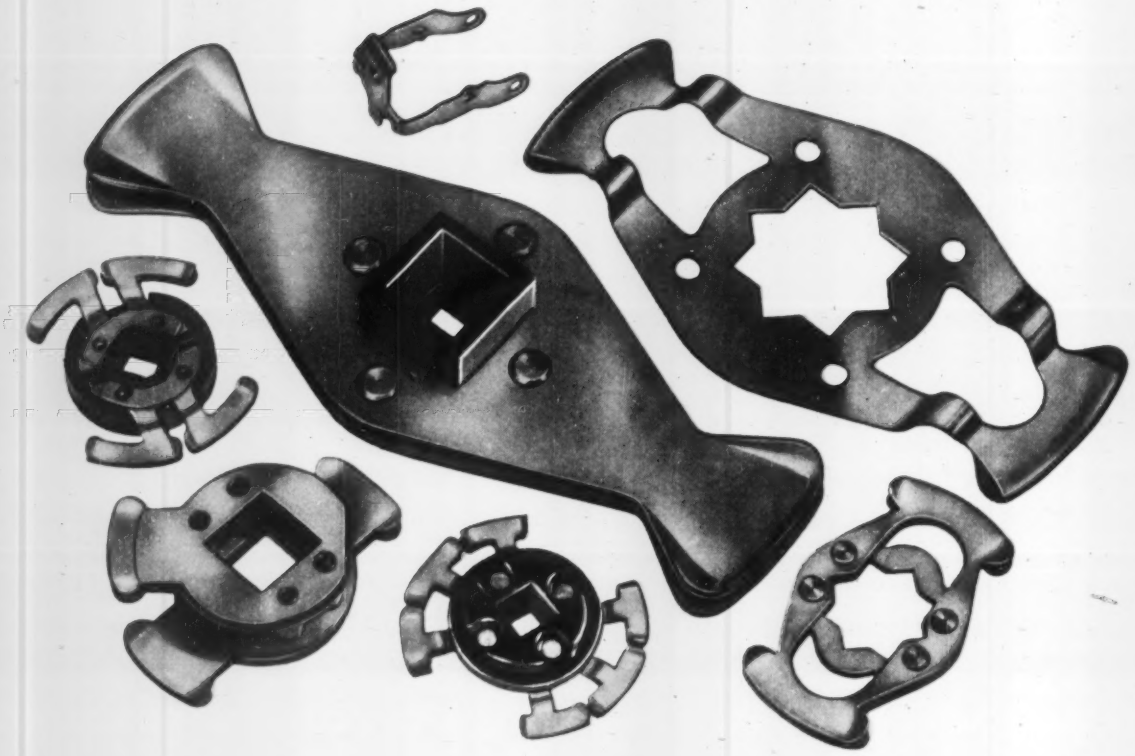


ELECTRICAL PROPERTIES — Best conductivity for equal strength of any of the non-precipitation hardenable alloys. All Seymour Phosphor Bronzes are non-magnetic.

FATIGUE RESISTANCE — Seymour Phosphor Bronze is noted for sustained resilience under almost endless fatigue cycles. Tensile strengths run as high as 120,000 psi.

CORROSION RESISTANCE — For all practical purposes, Seymour Phosphor Bronze resists corrosion in the same order as pure copper. This, plus great strength and ductility, makes it ideal for parts subject to corrosive action.

EASE OF FABRICATION — Seymour Phosphor Bronze has excellent physical properties for drawing, forming, and stamping. Suitable tempers are available for almost any requirement.

TECHNICAL DATA BOOK — Write for your copy of our newly printed Technical Data Book, which gives full information on Seymour Phosphor Bronze and Nickel Silver.

THE SEYMOUR MANUFACTURING COMPANY · SEYMOUR, CONN.

ASTE EXPOSITION

14a. Chromate Conversion Coatings. (22T22) C. W. Ostrander, service manager, Allied Research Products Inc.

14b. Metal Blasting and Finishing with Airless Blast Equipment (22T23). F. W. Pedrotty, director of application engineering, American Wheelabrator & Equipment Corp.

9 a. m. Arena Conference Room

Convention Hall

Plastic Postforming; Improved Investment Casting Design and Control

15a. Postforming of Thermoset Plastics (22T24). St. John Bain, project engineer, Formica Co. (Low-pressure thermoelastic forming of laminate sheets frequently permits interchangeability of press tools for metals and certain plastics; can be inexpensively produced in low volume.)

15b. (9:45) Improved Design and Dimensional Control for Investment Castings (22T25). R. I. Wood, president, Arwood precision Casting Corp. (Variables can be tricky; wax, plastic, ceramic mold material and metal all have physical variables; same is true of the product design, but variation ranges can be established.)

1:30 p.m. Arena Conference Room

Convention Hall

New Concepts in Abrasive-Belt Grinding

How to sharpen tungsten carbide tool bits to a finish of 2 to 16 micro-inches rms . . . and hold required accuracy of angles for 1 to 3 cents per tool. You can now automatically generate concave forms, like turbo rotor blades, as well as extremely convex forms, by cam grinding.

16a. Abrasive-Belt Grinding of Carbide Tools (22T27). E. E. Oathout, products engineer, Behr-Manning Corp.

16b. (2:15) Hydraulically Cammed Profile Grinding (22T28). A. F. Alt, chief engineer, Planet Products Corp.

1:30 p.m. Room 300

Convention Hall

Versatile Manufacturing Uses of Heat and Cold

On the hot side, simple to complex metal shapes can be flame-cut with the electric eye. On the cold side, sub-zero chilling down to 150° F is now highly efficient for stabilizing metals, testing materials, shrink fitting and treating perishable tools.

17a. Flame Cutting by Electronic Tracing (22T29). R. F. Helmkamp, machine cutting specialist, Air Reduction Sales Co.

17b. (2:15) Sub-Zero Chilling As An Industrial Process (22T30). R. S. Jamison, assistant to the president, Sub-Zero Products Co.

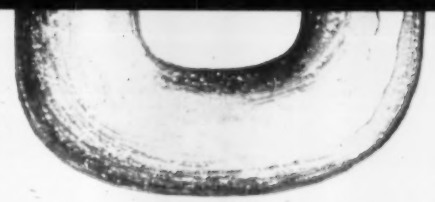
3 p.m. Ballroom

Convention Hall

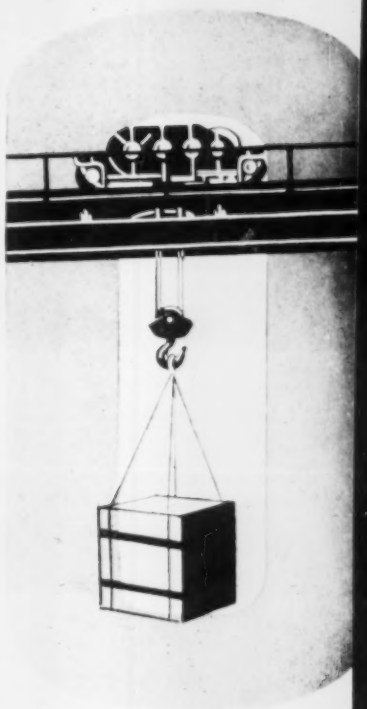
Solutions for High-Speed and Difficult Machining Applications

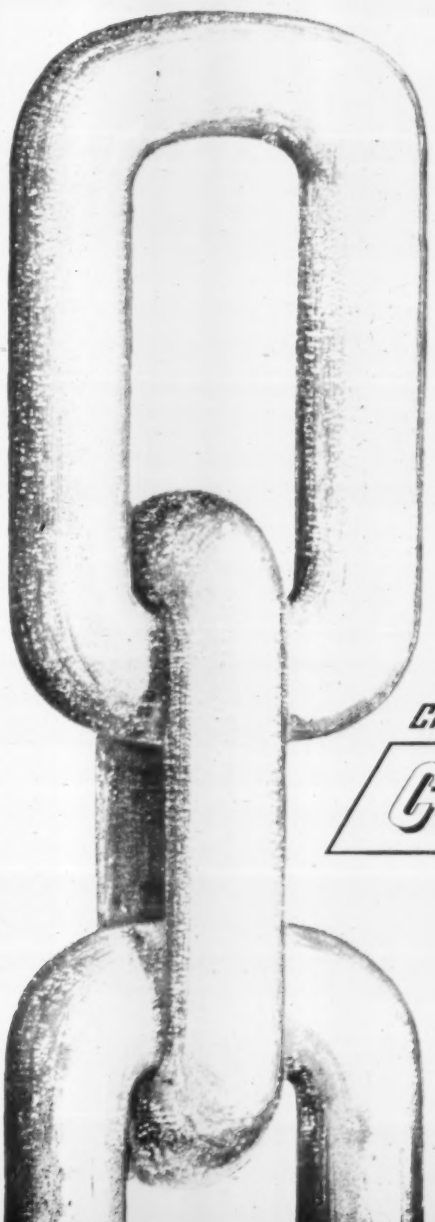
How ultrasonic machine tool developments may enable you to cut just about anything short of a diamond. How tooling production has been increased . . . on SAE 9310 gears, for instance. It's upped from 100 to 275 rpm . . . and from 4 to 24 hobbed gears per hour . . . all with 50 per cent increased tool life.

18a. Ultrasonic Tools for Hard-to-Machine Materials (22T31). J. P. Alonso, applications engineer, Research Division, Raytheon Mfg. Co.



is this ⇨ the MISSING LINK?





Strong link in your production chain can be a Conco Crane—custom-designed for a specific need. Conco Cranes are available in the capacity you need, the right lift, the right speed, the right clearances to serve a given station faster, at less cost, with less man power. Conco Cranes are backed by 36 years experience in the design of cranes, hoists, trolleys. Write for Bulletin 3000A illustrating and describing the Conco line.

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Conco Building Products Inc. Brick, Tile, Stone

Why stop AUTOMATION at Assembly?

Automation is a new name for an objective long pursued by industry's keenest minds. It means successive elimination of manual operations.

In the production of metal or plastic component parts — by machining, molding, etc. — automation has made advances that in some cases seem almost magical.

By contrast, *assembly* often plods along slowed by outdated methods.

Progress toward automation *does not* end where assembly begins for manufacturers who take full advantage of the P-K Fastening Method. They *eliminate* manual operations like tapping, nut running, inserts in plastic — and avoid the attendant trouble and expense. Automatic screw driving equipment can be used to further mechanize hand operations on many applications. Savings run up to 50% and more.

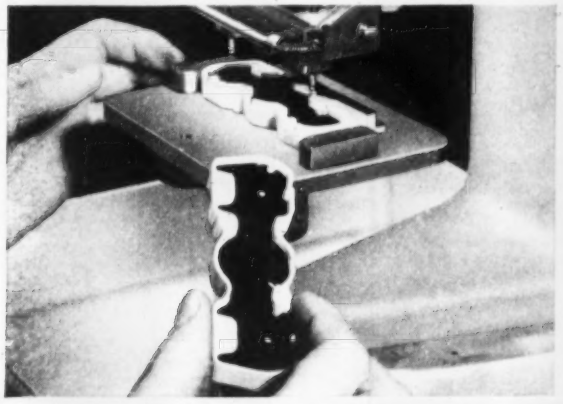
Complete automation is, for most, a *distant* dream. Meanwhile, assembly *hands* control your fastening costs. Find out how P-K Self-tapping Screws can *double — even triple* — their efficiency. It *pays* — and pays well — *today*. Talk to a P-K Assembly Engineer. Parker-Kalon Division, General American Transportation Corporation, 200 Varick St., New York 14.

. . . give millions of assembly hands a head start

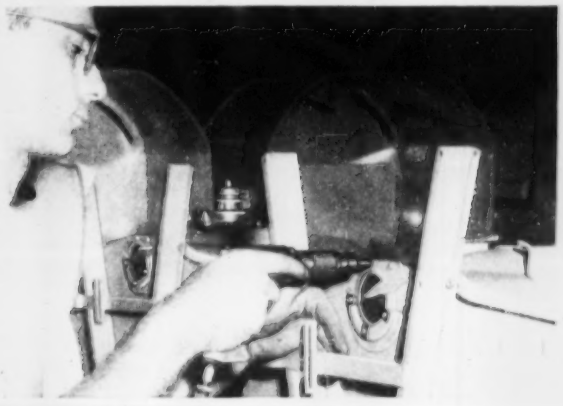
PARKER-KALON®

IN STOCK . . . see your nearby P-K Distributor . . .

AUTOMATIC DRIVING adds *extra* speed to the faster P-K Fastening Method. Here, an automatic, double-spindle, hopper-fed machine is being used for driving two P-K Type U Drive Screws simultaneously in a plastic electric outlet. Single or multiple spindle machines are available from several manufacturers.

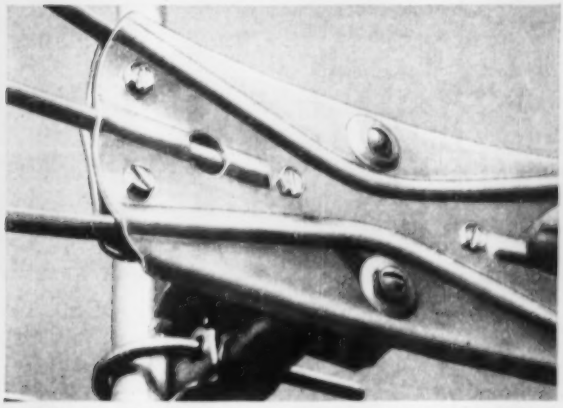


MAYTAG ASSEMBLY MOVES FASTER because fastenings made with P-K Self-tapping Screws are simpler, easier, dependably secure. In the Maytag Dryer shown, 80 Type A and 46 Hex Head Type Z are used, in all, for fastening sheets from 24 to 11 gage — driven with air-operated tools.



with P-K quality–planned assembly savings pay off

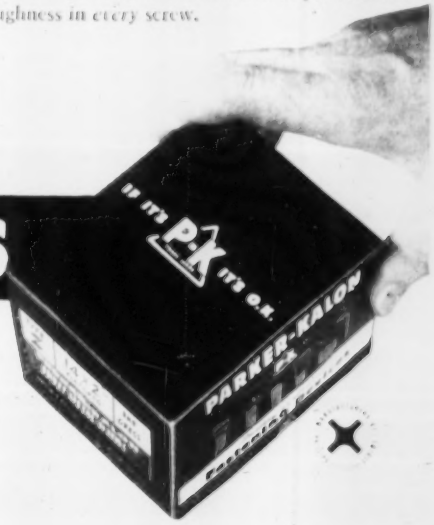
EVINRUDE RELIES ON PROVED STRENGTH of P-K Self-tapping Screws for this critical fastening in an outboard motor sub-assembly, where lasting security is vital. A P-K Binding Head Type F is driven through a die-cast aluminum drive housing and acts as a retainer for the stamped aluminum exhaust baffle.



TELEREX GETS CLEAR PICTURE of performance. For this "Hi-V" Reflector, Telerex, Inc., needed proved resistance to high tension and vibration. They specified 17 slotted Hex Head Z, reasoning soundly that P-K, the *originator*, knows best how to put uniform hardness and toughness in *every* screw.

The Original

SELF-TAPPING SCREWS



your local Supply and Service Specialist

ASTE EXPOSITION

15b. (4:00) Hobbing at High Speeds and Heavy Metal Removal (22T32)—J. W. Rapp, superintendent of gear manufacturing, Ohio Axle & Gear Division, Rockwell Spring & Axle Co.

8 p.m. Burgundy Room

Bellevue-Stratford Hotel

Advantages in Parting and Extruding Cold Steel

In the nick-and-break method of parting you can get faster production of square-cut blanks without crystalline distortion. With correct die design, cold extrusion can now give you finished shapes to closer tolerances with glass-smooth surfaces, eliminating subsequent machining except threading.

15a. Shear-Fracture Parting of Steel Billets (22T33)—W. C. Tucker, chief engineer, Buffalo Forge Co., Machine Tool Division.

15b. (5:00) Successful Design of Steel Parts for Cold Extrusion (22T34)—D. I. Brown, Market Development Manager, Mullins Mfg. Corp., Koldfin Division.

8 p.m. Ballroom

Bellevue-Stratford Hotel

How to Lick Your Tough Milling Problems

A group of internationally known specialists has set up an agenda, with opportunity for all present to participate to answer the most vital questions on the subject.

20. "Clinic" on Improved Milling Practice (Panel Discussion):

W. A. Coe, sales engineer, Nelco Tool Co., Inc.;
J. Daugherty, consultant, Giddings & Lewis Machine Tool Co.;
Dr. Horace Frommelt, staff consultant, Detroit Milling Cutter Co.;
K. B. Kaiser, assistant chief engineer, Ingersoll Milling Machine Co.;
E. J. Krabacher, research engineer, Cincinnati Milling Machine Co.;
J. R. Roubik, assistant research engineer, Kearney & Trecker Corp.;
T. G. Vickers, master mechanic, Clark Equipment Co., Transmission Div.

THURSDAY, APRIL 29

9 a.m. Arena Conference Room

Convention Hall

Cutting Fluids and Methods for Machining Difficult Materials

How to pick the right cutting fluid with greater speed and certainty . . . what has been learned in the last year and a half about cutting and forming titanium.

21a. An Orderly Use Classification of Cutting Fluids (22T35)—R. G. Moyer, group engineer, Pure Oil Co.

21b. (5:45) What's Known Today About Machining Titanium (22T36)—G. T. Fraser, sales manager, Rem-Cru Titanium Inc.

9 a.m. Ballroom

Convention Hall

Parts Design for Cold Pressure Welding

Proper parts design, tooling and pressures can insure full-strength molecular cold-weld bonding of similar or dissimilar ferrous and nonferrous metals; simple tools require no special skilled labor.

22a. Preparation and Tooling for Cold Pressure Welding (22T37)—W. A. Barnes, vice president, Engineering and Production Division, Utica Drop Forge & Tool Corp.

10 a.m. Ballroom

Convention Hall

Extending Industrial Plant Layout to Take on Depth

How three-dimensional color-coded layout planning can help you visualize even the most complex future plant.

22b. Visualizing Plant Layout in Three Dimensions (22T38)—H. H. Dasey, president, Visual Plant Layouts, Inc.

1:30 p.m. Arena Conference Room

Convention Hall

How Integrated Automation Can Revolutionize Production Patterns

How to apply automation to conventional equipment. Examples: the automatic piston factory and the National Bureau of Standards' brand new "Project Tinkertoy." Its implications must challenge everyone involved in equipment manufacture, production of fabricated products and those who deal with personnel training and personnel relations.

23. The Challenge of Automation (22T39)—John Diebold, management consultant.

1:30 p.m. Ballroom

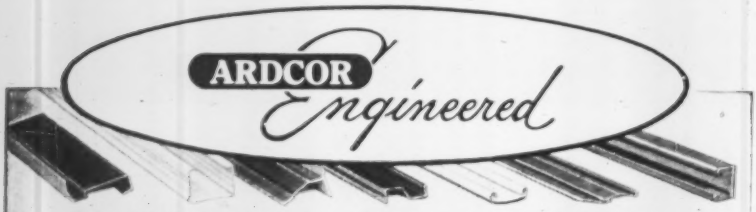
Convention Hall

The Latest Fixture Assembly and Inspection Tools

How to use optical tooling for fixtures. Also, new data on standardized gaging cartridges and other new concepts of gaging and inspection now available to industry.

24a. Optical Tooling for Fixture Construction (22T40)—R. E. Stegler, engineer, Manu-

ARDCOR Engineered



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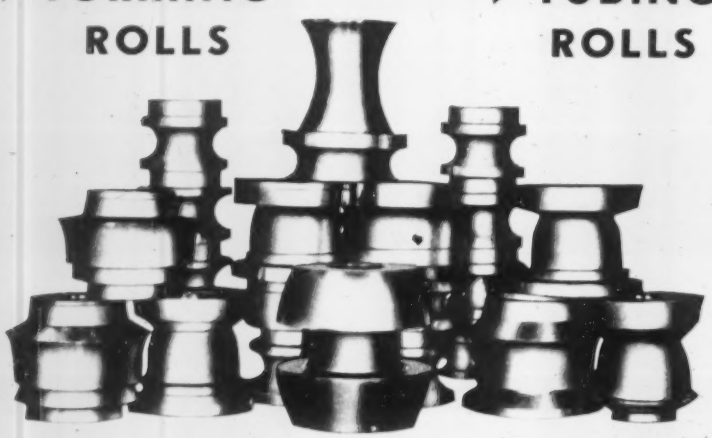
▶ FORMING ROLLS

▶ TUBING ROLLS



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Made of ARDCORLOY—a special alloy steel.

Maximum production speeds—better products. Any desired profile up to 36 inches in diameter.

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And *all* H-VW-M cleaners—whether they're for standard or special applications—have to meet our high standard of purity under rigid quality control. Soak or electro cleaners, specific purpose cleaners such as acidic types and aluminum etchants—custom made cleaners for special jobs—all combine to make available the most complete line of cleaners in the plating industry.

This is all a result of H-VW-M's constant progress for more than eighty years. We call it Platemanship—our seal of quality that's your guarantee of getting the best that industry has to offer, not only in cleaners, but in every phase of plating and polishing.

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ASTE EXPOSITION

facturing Research and Development Section, Republic Aviation Corp.

24b (2:15) "New Concepts of Gaging and Inspection." (22T41)—W. L. Witt, assistant manager, Sales Division, and Harry Kietaber, gage application engineer, Sheffield Corp.

3 p.m. Ballroom

Convention Hall

How to Improve Your Inspection Ways and Means

Equipment, operation and supervision are all represented by a panel of authorities, whether your problem lies in the control of quality, manual or automatic gaging, or non-destructive testing.

25. Inspection Ways and Means

(Panel Discussion)

P. G. Fishbeck, manufacturing engineer, Accessories Div., Thompson Products Inc.;
J. Manuele, director of headquarters, Quality Control, Westinghouse Electric Corp.;
F. Meyer, Jr., chief engineer, Taft-Peirce Mfg. Co.;
F. B. Murphy, field manager, Johnson Gage Co.;
S. D. Nicolas, chief inspector, Merz Engineering Co.;
E. C. Polidor, chief engineer, Optical Gaging Products Inc.;
G. H. Stimson, gage sales manager, Greenfield Tap & Die Corp.

7 p.m. Ballroom

Bellevue-Stratford Hotel

22nd Annual Banquet of the American Society of Tool Engineers

Speaker: Dr. Henry T. Heald, chancellor, New York University.

Note: For Banquet Reservations at $7.50 per plate send your check directly to the American Society of Tool Engineers, Detroit.

FRIDAY, APRIL 30

9 a.m. Room 300

Convention Hall

What the Tool Engineer Needs to Know About Powder Metallurgy

Why and when powder metallurgy may be your best answer to better product design and tooling.

26a. Product Design For Powdered Metal Parts. (22T42)—G. Sterb, vice president and technical director, American Electro Metal Corp.

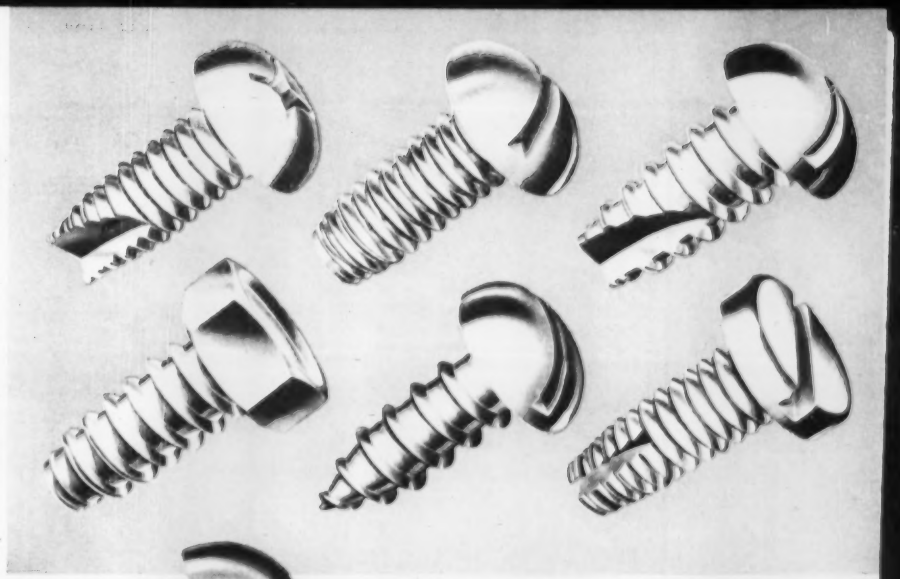
26b (2:00 p.m.) Tooling for Powdered Metal Parts. (22T43)—J. F. Kuzmick, consultant, Meaded Carbide Tool Co.

9 a.m. Arena Conference Room

Convention Hall

How Plastics Are Moving Into Full-Scale Production

For jigs, plastics provide structures which are exceedingly sturdy, strong and dimensionally stable, lighter than aluminum, easier



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You enjoy the economy of quality when you use Townsend tapping screws. They are made to provide an easy method of securely fastening metal, plastics, wood, asbestos and compositions with efficiency.

The use of Townsend thread forming screws eliminates costly tapping operations as the precision-rolled thread forms a mating thread when the screw is driven into the material. They are widely used in sheet metal, castings, and a variety of non-metallic materials. They may be removed and replaced without impairment of their holding power.

Townsend thread cutting screws have an off-center slot which presents a true, sharp, thread-cutting face which acts as a tap when the screw is driven into an untapped hole. By cutting their own threads, these screws fit tightly and resist loosening from vibration. There is no chance of size discrepancy between screw and tapped hole.

Townsend tapping screws are available in the types shown here in a variety of head styles with slotted or Phillips recessed and hex heads. They are but one group of the Townsend family of 10,000 types of standard and special fasteners and small parts used by all industry to improve assembly and speed production.

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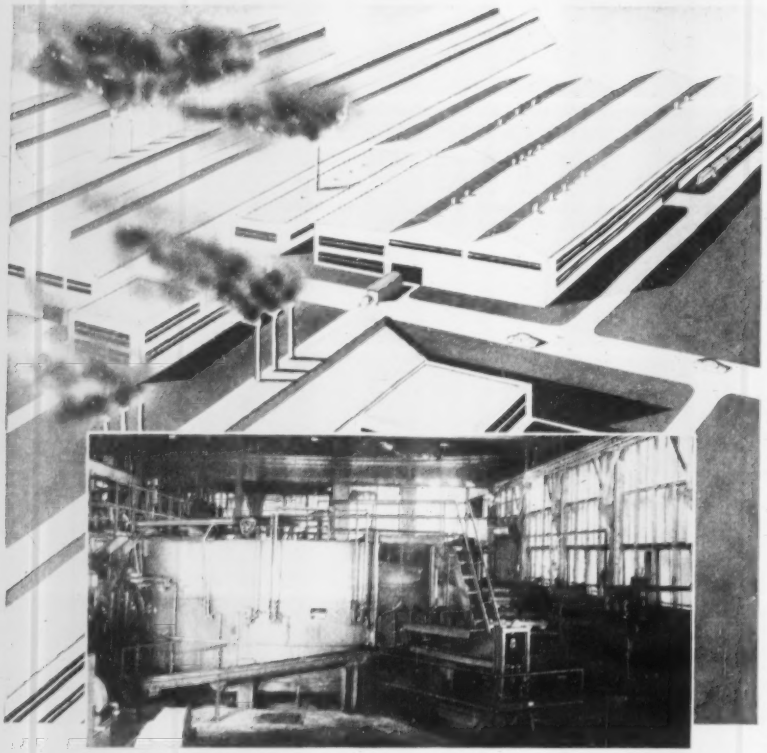

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to fabricate than steel. For dies, it's quick and easy to make duplicates which can each produce thousands of pieces. Results of severe road tests of plastic auto bodies. Are mass production techniques just around the corner?

27a. Plastic Fixtures Have Wide Use (22T44)—B. Sokol, plastic engineer, Republic Aviation Corp.

27b. (9:45) Plastic Dies Move Into Regular Production Service (22T45)—G. C. Adams, staff engineer, Rezolin Inc.

27c. (10:30) Plastic Auto Body Developments (22T46)—W. A. Hermonat, technical representative, Naugatuck Chemical Division, U. S. Rubber Co.

1:30 p.m. Room 300
Convention Hall

Newest Approaches to Your Welding Problems

How to weld and braze high-temperature materials such as stainless steel 347, cobalt alloy 25, and titanium. Where to use stud welding instead of drilling and/or tapping a plate when a stud must be joined to it.

28a. Welding and Brazing of High-Temperature Materials (22T47)—F. H. Stevenson, production engineer, Aerojet-General Corp.

28b. (2:15) Ferrous and Nonferrous Stud Welding (22T48)—R. C. Singleton, industrial sales manager, Nelson Stud Welding Division, Morton-Gregory Corp.

1:30 p.m. Arena Conference Room
Convention Hall

Latest Techniques in the Forming of Sheet Metals

How industry can benefit from government research which has developed complete standardized tooling for stretch-wrap forming. You can now deliberately predeform metal shapes to conquer the most difficult types of draw.

29a. Principles of Stretch Wrap Forming (22T49)—K. Drone, chief engineer, Hufford Machine works Inc.

29b. (2:15) Planned Pre-Deforming of Shapes for Better Drawing (22T50)—C. M. Geddis, assistant master mechanic, Buick Motor Division, General Motors Corp.

3 p.m. Ballroom
Convention Hall

How Others Have Improved Their Workholding Ways and Means

One of the oldest, most basic responsibilities of the tool engineer is still as challenging as the diversity of the manufactured products themselves. Ask what you want of the panel concerning fixtures, jigs, chucks, collets and the like—whether mechanically, pneumatically, hydraulically, magnetically or otherwise actuated.

30. Workholding Ways and Means
(Panel Discussion)
J. L. Balciunas, chief engineer, Skinner Chuck Co.
L. R. Burger, sales manager, Logansport Machine Co. Inc.
K. Cole, chief designer, N. A. Woodworth Co.
J. I. Karash, production manager, Reliance Electric & Engineering Co.
P. Lindhuber, chief tool designer, Spicer Mfg. Division, Dana Corp.
R. W. Newton, tool analyzer, International Business Machines Corp.
J. E. Rotchford, vice president, Codding Inc.

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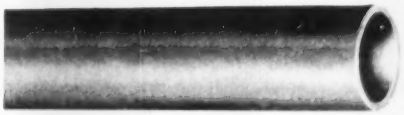

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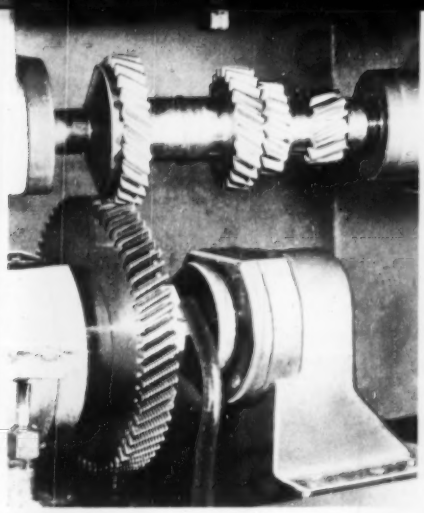
CONFERENCE AND INDUSTRIAL EXPOSITION

EXHIBITORS

Exposition Hours—9 a.m. to 5 p.m.

Convention Hall, Philadelphia—April 26-30, 1954

Accurate Bushing Co., Garwood, N. J. 141
Ace Drill Bushing Co. Inc., Los Angeles 917
Ace Drill Corp., Adrian, Mich. 125
Acme Steel Products Division, Acme Steel Co., Chicago 904
Acme Tool Co., New York 1022
Adamas Carbide Corp., Kenilworth, N. J. 941
Air Conversion Research Corp., Chicago 1251
Airmite Division, Stewart-Warner Corp., Chicago 1319
George H. Alexander Machinery Ltd., Birmingham, Eng. 905
Allegheny Ludlum Steel Corp., Brackenridge, Pa. 224
Allen Tool Co., division Allen Industries Inc., Springfield, O. 1005
Allison Co., Bridgeport, Conn. 1331
Alpha Tool Co. Inc., Elmhurst, N. Y. 1916
Alpha Tool Works, Detroit 1744
American Cooper Corp., Paterson, N. J. 102
American Cystoscope Makers Inc., New York 106
American Drill Bushing Co., Los Angeles 1234
American Milling Machine Inc., Los Angeles 1005
American Machinist, New York 1120
American Pullmax Co. Inc., Chicago 1703
American Sip Corp., New York 1546
American Society of Tool Engineers, Detroit Center Bldg.
American Tooling Corp., New York 909
American Wheelabrator & Equipment Corp., Mishawaka, Ind. 1205
B. F. Ames Co., Waltham, Mass. 338
Ampco Metal Inc., Milwaukee 1130
Amplex Division, Chrysler Corp., Detroit 1827
F. E. Anderson Oil Co. Inc., Portland, Conn. 1416
Anderson & Sons Inc., Westfield, Mass. 609
R. B. Annis Co., Indianapolis 742
Applied Hydraulics Magazine, Cleveland 2160
Arbor Tuf Slate Corp., New York 2163
Armstrong Bros. Tool Co., Chicago 232
Art Equipment Corp., Bryan, O. 1005
Arwin Rail & Hegeman Electric Co., Hartford, Conn. 1929
Associated American Trading Co., New York 1831
Associated Machine Tool Corp., Pittsburgh 2167
Astro Industrial Corp., Mount Vernon, N. Y. 1231
Automatic Methods Inc., Elizabeth, N. J. 1005
AUTOMATION Magazine, Cleveland 1247
Automotive Industries Magazine, Philadelphia 505
Ex-Cell-O Corp., Detroit 1526
Ex-Cell-O Corp., Detroit 1526
Ex-Cell-O Corp., Detroit 1526



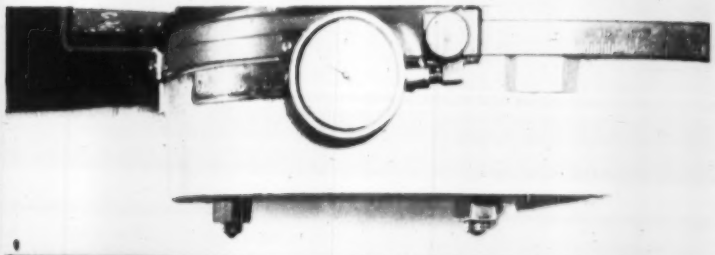
This Month's GEAR PIX

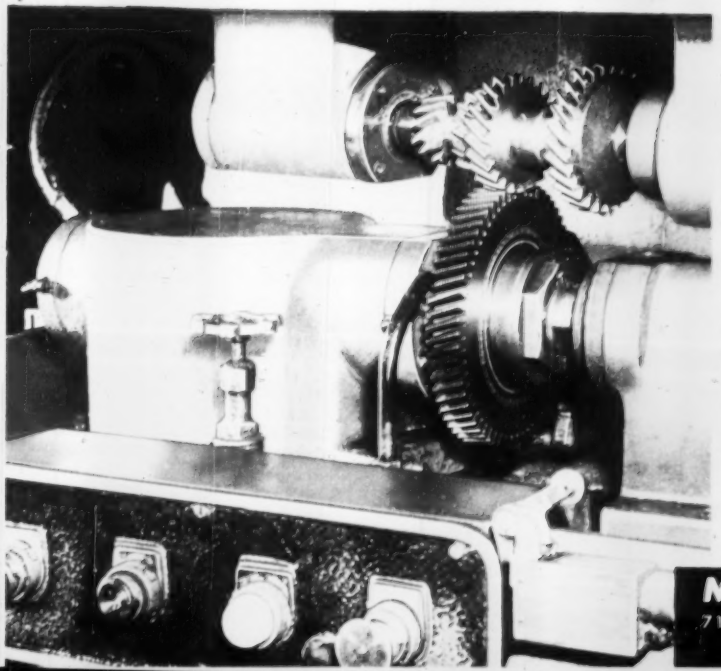
SHAVING—A large battery of Michigan model 870 rotary gear finishers (each operator handles two or three machines) shaves the gear teeth on this standard transmission cluster in a Detroit automotive plant. Pneumatically actuated adaptors speed the loading operations.

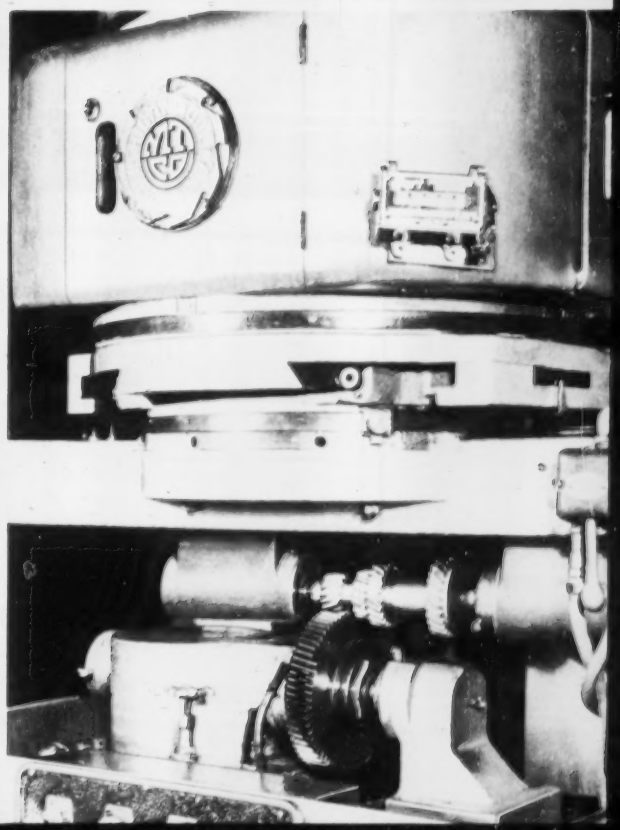
(*above*)—Shaving cycle time on this 27-tooth driver on the Michigan 870, using the modified underpass method, is 30 seconds.

(*lower left*)—This 23-tooth 3.253" diameter .765" face width intermediate gear on the cluster is finished in 24 seconds cycle time on Michigan 870 gear shavers by the modified underpass method.

(*lower right*)—Reverse gear on the cluster, 13-teeth, 8.25 pitch, .948" face width, is shaved by the underpass method on Michigan 870 gear finishers in 29 seconds.







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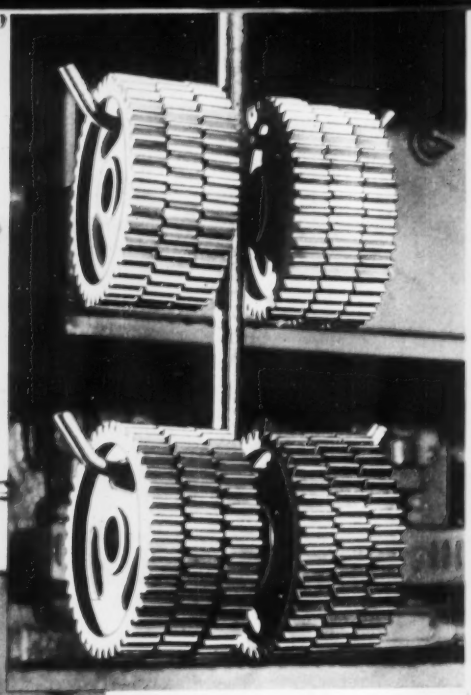
SHAPER

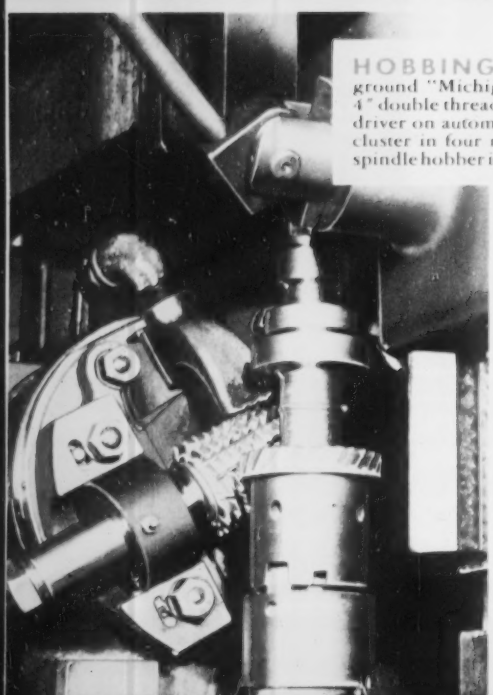
This Month's

GEAR PIX

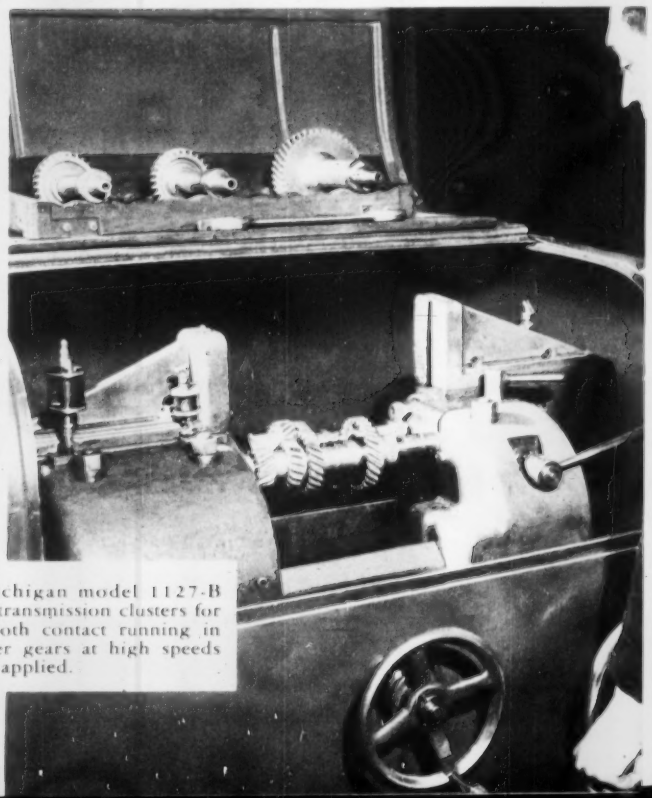


SPROCKETS—Two operators attending four Shear-Speed gear shapers, model 1853, cut teeth on 12 42-tooth cast iron camshaft timing gear sprockets (5.018" diameter—.76" face) in 53 seconds in one of the large Detroit automotive plants. Three sprockets are loaded on each arbor; hence, all the teeth on each sprocket are cut every 18 seconds—one tooth every .43 second actual cutting time on each of the respective machines.

On the four Shear-Speed gear shapers this results in one sprocket every 4.4 seconds; one tooth every 1/10 second.



HOBBING—Accurate unground "Michigan Process" 3" x 4" double thread hobs cut 27-tooth driver on automotive transmission cluster in four minute cycle on 8-spindle hobber in automotive plant.



SPEEDER—Michigan model 1127-B tests automotive transmission clusters for quietness and tooth contact running in mesh with master gears at high speeds with brake loads applied.

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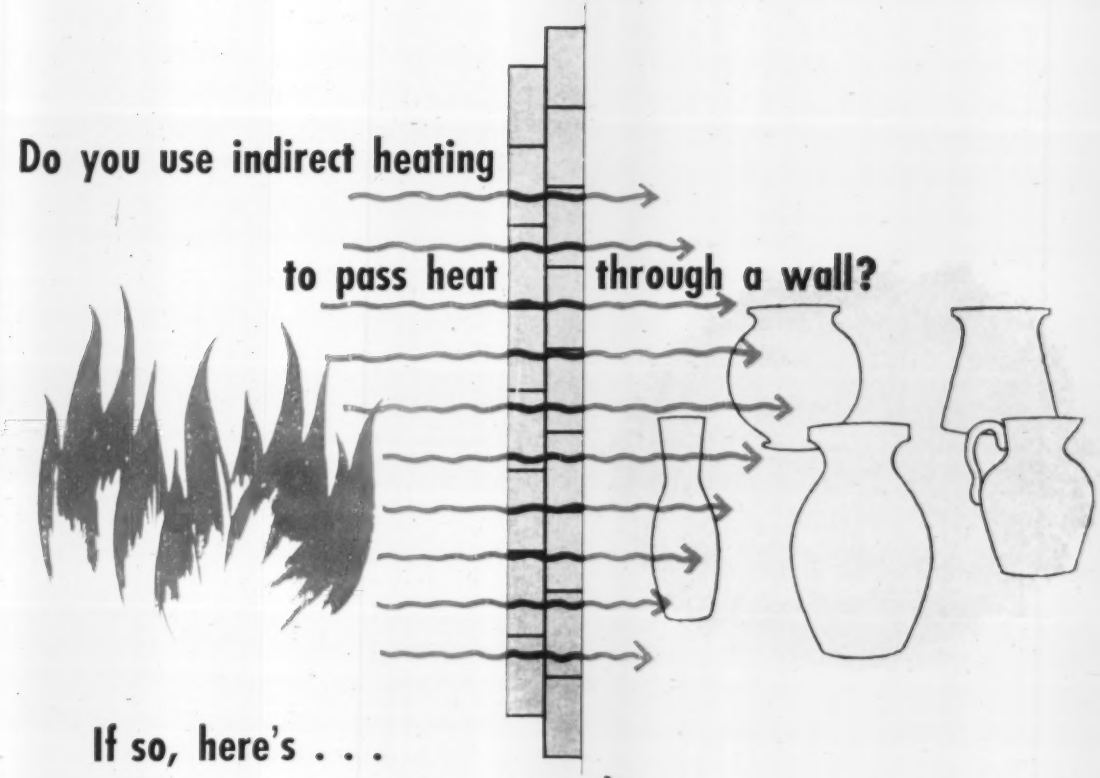

Do you use indirect heating to pass heat through a wall?

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A refractory that's "heat-transparent"

This is how three commonly used refractories compare in thermal conductivity. (BTU/hr, sq ft and °F/in. of thickness at 2200 F). From left to right: silicon carbide, aluminum oxide, and fireclay.

While you ordinarily think of a refractory as a heat-*containing* material, CARBORUNDUM's silicon carbide is anything but. It actually transmits heat *11 times faster* than fireclay. Practically as fast as the high temperature alloys!

This property is silicon carbide's greatest asset. It makes it ideal for retorts, muffles, and hearths . . . or wherever you pass heat through a wall. Take one case: When used to replace the fireclay arch of a Mannheim furnace, output was doubled — and the fuel input ratio was cut 50%! And that's not an exaggerated example.

This same property enables silicon carbide to absorb and release *up to five times as many BTU's* per second as fireclay. It's ideal for checkers, recuperators, and other heat-exchange equipment. On the other hand, it's equally good where heat has to be dissipated (e.g. arc shields, pot settings, etc.)

But the clinching advantages are that it has a tested crushing strength of over 10,000 psi at 2500 F . . . is safe to use up to 3000 F . . . withstands abrasive/erosive wear-and-tear far better than metals . . . is inert to acid attack . . . and, in general, outlasts other materials, even under the most destructive conditions known.

In fact, this ability to withstand extreme conditions distinguishes *all* CARBORUNDUM's super refractories (including one of the best *insulating* materials for high temperature work). These range all the way from a cotton-like ceramic fiber to super-dense refractories that are cast like metals. So whether you need to conduct heat, or contain it, CARBORUNDUM's "man-made minerals" offer unusual possibilities. We'd like to explore their interesting features with you.

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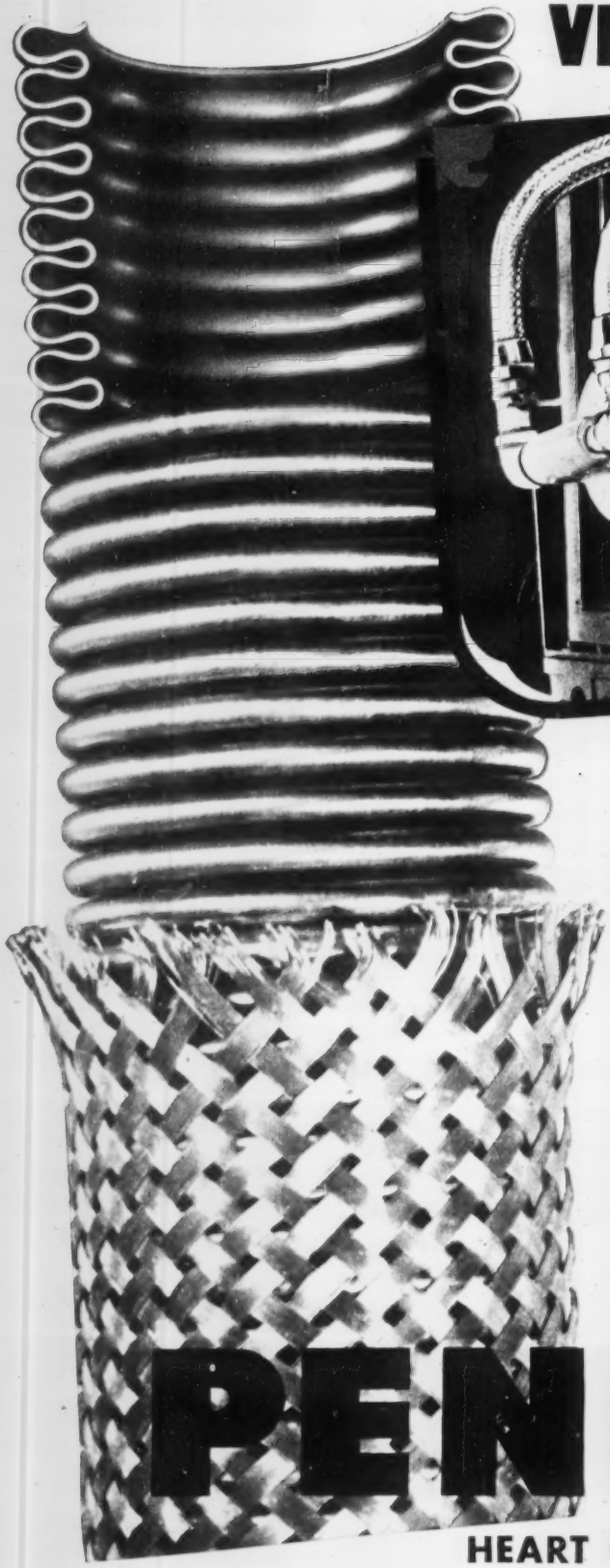

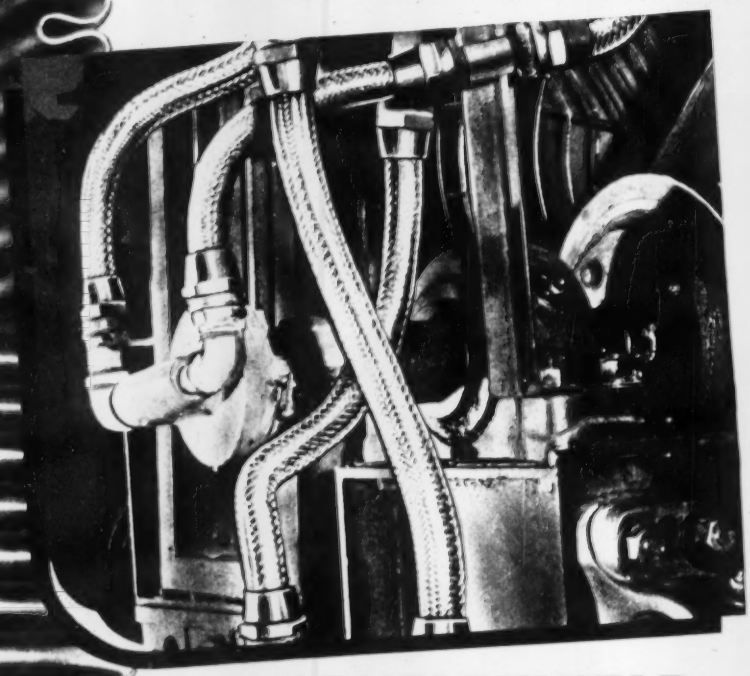

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H. E. B. Machine Tools Inc., New York 360
H. & H. Research Co., Detroit 1922
Wm. Halpern & Co. Inc., Mt. Vernon, N. Y. 2019
Hammond Machinery Builders, Inc., Kalamazoo, Mich. 1393
Handy & Harman, New York 615
Hanna Engineering Works, Chicago 1317
Hannifin Corp., Chicago 827
Hansen Mfg. Co., Cleveland 1352
Hansford Mfg. Corp., Rochester, N. Y. 2064
Hanson-Whitney Co., Hartford, Conn. 114
R. G. Haskins Co., Chicago 628
Hause Engineering, Montpelier, O. 2001
Haynes Stellite Co., Division of Union Carbide & Carbon Corp., New York 23
Heinrich Tools Inc., Racine, Wis. 1936
Heintz Mfg. Co., Philadelphia 1135
Heli-Coil Corp., Danbury, Conn. 214
Heller Bros. Co., Newcomerstown, O. 2121
Henry & Wright, division of Emhart Mfg. Co., Hartford, Conn. 1960
Hillyer Co., New York 2100
Homestrand Inc., Larchmont, N. Y. 303
Honan Crane Co., subsidiary of Houdaille-Hershey Corp., Lebanon, Ind. 1628
Horton Chuck, division of Horton & Son, Windsor Locks, Conn. 2004
E. F. Houghton & Co., Philadelphia 1741
Howe & Fant Inc., S. Norwalk, Conn. 1967
Hudson Automatic Machine & Tool Co., Union City, N. J. 2111
Huron Machine Products Inc., Dearborn, Mich. 2005
Hydraulic Power Division, Hydraulic Press Mfg. Co., Mt. Gilead, O. 1212

Ideal Industries Inc., Sycamore, Ill. 331
Index Machine Co., Jackson, Mich. 1305
Industrial Chrome Division, Ward Leonard Electric Co., Mt. Vernon, N. Y. 137
Industrial Diamond Association of America, New York 1861
Industrial Filtration Co., Despark Corp., Lebanon, Ind. 1905
Industrial Scientific Co., New York 1307
Industrial Technics Inc., Ann Arbor, Mich. 434
Ingersoll Rand Co., New York 1855
Inspection Equipment Co., Birmingham, Mich. 241
International Research & Development Corp., Columbus, O. 135
Iron Age, New York 829

Jacobs Mfg. Co., W. Hartford, Conn. 1360
James Cylinder Co., Philadelphia 1313
Jesse Mfg. Co., Chicago 1812
Chas. L. Jarvis Co., Middletown, Conn. 1402
C. E. Johansson Gage Co., division of Swedish Gage Co., Dearborn, Mich. 132
Eric S. Johnson Co., Costa Mesa, Calif. 2156
Johnson Gage Co., Bloomfield, Conn. 324
Johnson Mfg. Corp., Albion, Mich. 1917
Jones & Lamson Machine Co., Springfield, Vt. 1400
A. A. Jones & Shipman Ltd., Leicester, Eng. and Montreal, Canada 1901

Kalamazoo Tank & Silo Co., Kalamazoo, Mich. 1731
Kaufman Mfg. Co., Manchester, Mich. 1911
Kearney-Trecker Corp., Milwaukee, Wis. 1
Kennametal Inc., Latrobe, Pa. 1927
Kingsbury Machine Tool Co., Keene, N. H. 1250
Kinney Co. Inc., Long Island City, N. Y. 2020
Kirk-Latham Co., Inc., New York 1
Knuth Bros. & Tube Inc., Berkley, Mich. 2031

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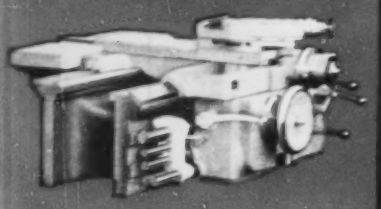
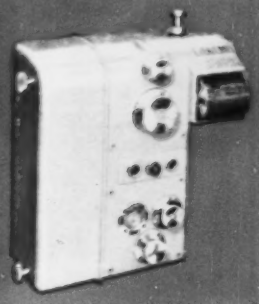


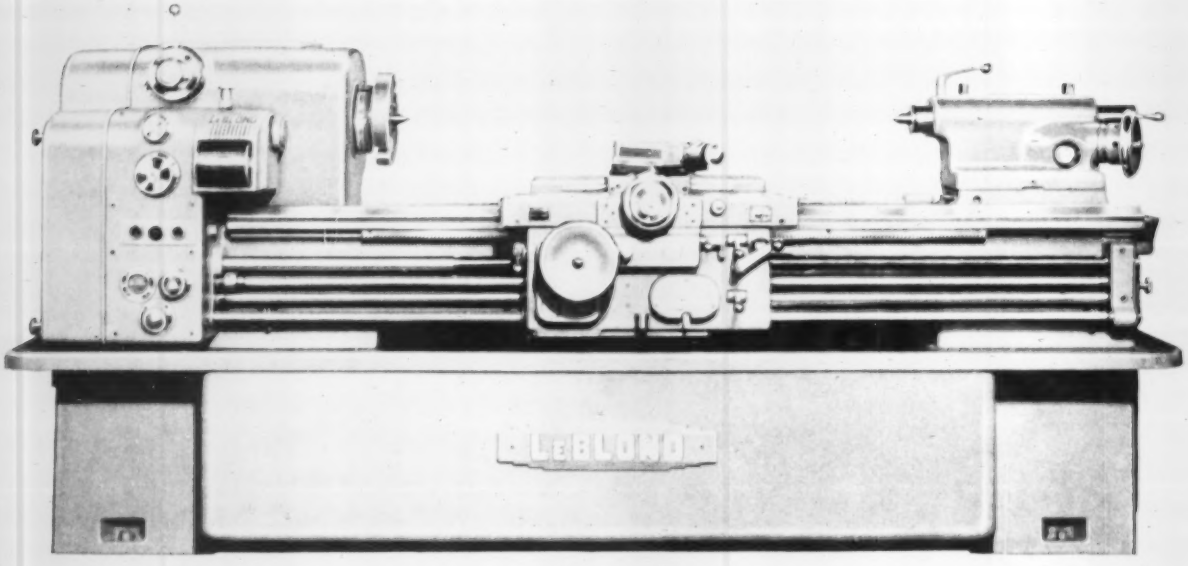


Satin-smooth Power Rapid Traverse to the carriage and cross slide plus pick up traverse to the tailstock. No jerking, jolting or jumping. Gives you the most in operator convenience as an integral part of the apron. First developed by LeBlond in 1935.

Automatically Positioned Leadscrew and Rod Supports perfected in 1923.

A Universal Quick-change Box with 30 feeds and threads in two ranges. You can cut from 120 threads to ¼ thread per inch — without setting pick-off gears, mounting a sub-head or using any other attachment. Diametral pitch threads, leads in inches, millimeter leads and module pitch leads also can be cut by making a slight gear change. Put into production by LeBlond in 1937.

Automatic Chasing Stop, used primarily for cutting threads, limits cross slide travel positively and accurately. Makes possible speedy chasing, since cross and length power rapid traverse can be used to bring cross slide quickly back to exact starting position for each pass.

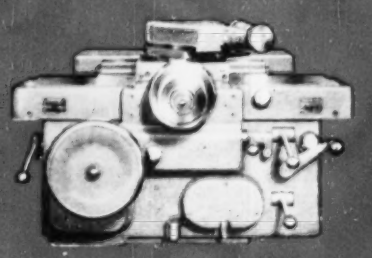


Condensed RT Lathe Specifications:

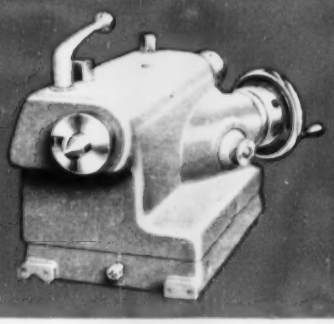
Swing over bed and carriage wings	18½"	Feed and thread changes	60 regular 30 coarse
Swing over compound rest	11½"		
Distance between centers, base length	30"	Feeds, range	.0007-2.064 ipr
Spindle speeds, range, rpm			
Low back gear	6 to 60	Threads per inch, range	2-120 regular ¼-1⅛ coarse
High back gear	30 to 300		
Direct belt drive	150 to 1500	Floor space required	96" x 48"

had today's Most Wanted Features

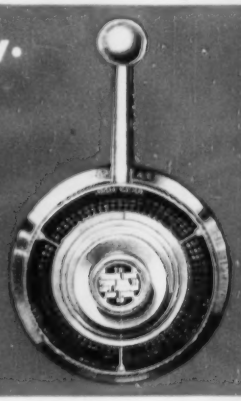
advancements set the standard for lathes today.



RT Combined Feed Apron with built-in Taper Attachment achieved in 1939. Cuts gradual or steep tapers with the larger dimension either towards the tailstock or headstock—without special machine set-ups.



An Exclusive Off-set Handwheel Tailstock employing a worm-and-rack construction for positive position locking, greater operator convenience plus Hollow Tailstock Spindle adaptability. Equipped with a direct reading spindle travel indicator.



And in 1946, the ***Variable-voltage Speed Control*** was incorporated into the head to provide over 300 spindle speeds in three ranges controlled by a single lever.

After five years in development and four years of on-the-job testing in LeBlond's production line, Industry met for the first time the 16" RT Tool Room Lathe at the 1947 National Machine Tool Show. There the RT's spectacular features far ahead of their time caused a flurry of comment about its amazing versatility. This lathe could do almost anything.

Only within the last few years have tool engineers throughout the lathe industry built into their lathes those features of the LeBlond RT Lathe that were "new" back in 1935 . . . in 1937 . . . in 1941 . . . in 1946. Features that made the RT Lathe famous for the ability to handle almost any job without time-wasting special machine set-ups. Even in 1947, there were many who felt their tool room requirements were not varied enough for them to take full advantage of the RT's vast potential.

By adopting those early RT features on their current models, lathe makers acknowledge the greatness of LeBlond's RT Tool Room Lathe, conceived *almost 18 years ago.*

THE R. K. LEBLOND MACHINE TOOL CO., CINCINNATI 8, OHIO

For a detailed description of the LeBlond 16" RT Tool Room Lathe and the lower-priced 16", 16-speed RT Engine Lathe, send for Bulletins RT-31 C. and HD-31. C.

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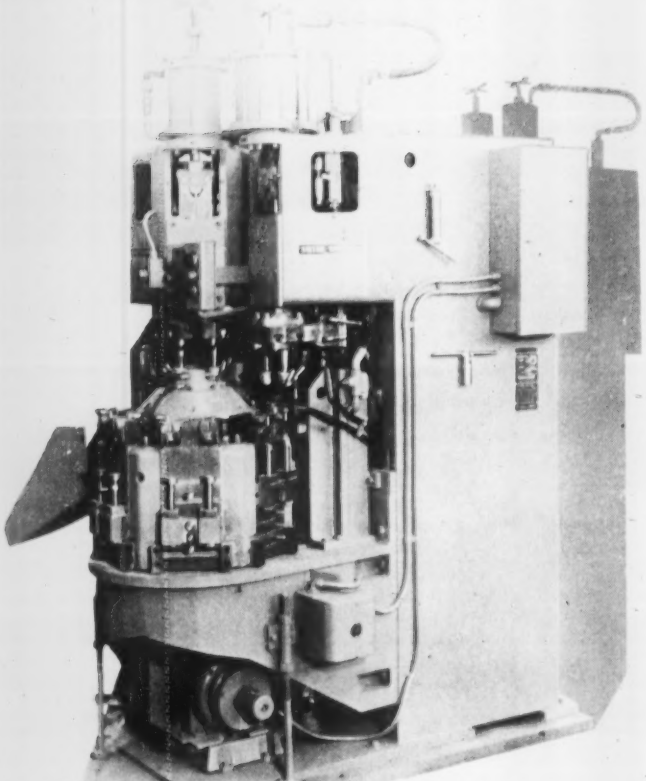
● "What's the best method for automatically loading and unloading resistance welders?" . . . "Can the welders be made an integral part of the production line?" . . . "What mechanical devices can be employed to make resistance welders automatic?"

Automatic resistance welding may be the production key you have been seeking to improve your costs. By calling in T-W you will gain the benefit of their work with automation as applied to resistance welding. One recommendation by T-W application men may make the big difference in your costs. **T-W has the facilities, the engineers and the reputation for the best in resistance welding.**



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Machine and Tool Blue Book, Wheaton, Ill. 913
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Magnaflux Corp., Chicago 704
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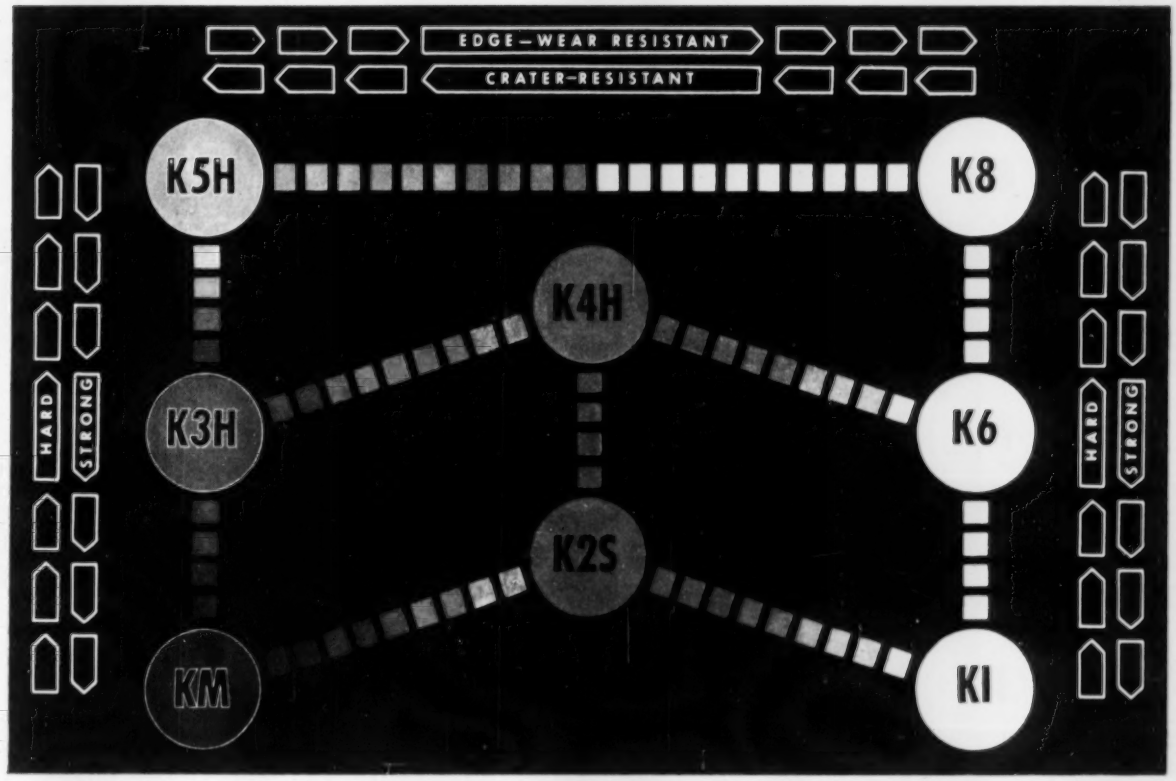
Modern Tool Inc., Manchester, O. 2005



NOW! A Quick, *Easy-to-Use* Guide to Efficient Machining

Here's the first simplified system for selecting carbide tool grades. Kennametal's new grade selection method assures top tool performance on every machining job. It's easy to use and eliminates guesswork because grades are grouped according to their wear characteristics (edge-wear and crater-resistant); also according to relative strength with strong, intermediate and hard grades included in each group. These eight Kennametal grades meet all machining requirements.

Kennametal's grading system is unmatched in the industry for simplicity. Any experienced machinist can use it to quickly adjust grades for better tool performance. For example: If K5H is being used and crater is no problem, a switch to K4H, which is more edge-wear resistant, will provide longer tool life. Conversely, if K4H is being used and crater is excessive, a switch to K5H would improve tool life.

Your Kennametal representative will gladly help you apply this grade selection system to your machining operations. He can also help apply these eight grades to "wear spots" in your product, your processing lines, or any place a hard, wear-resistant metal is needed. Just give him a call. Kennametal Inc., Latrobe, Pa.

Learn WHY

"IT PAYS TO BE A GOOD TOOL DETECTIVE"

"It Pays to Be a Good Tool Detective" will be the topic for Wednesday, April 28, at 9:00 A.M., at the Carbide-Seminar. Kennametal engineers will discuss selection of proper grades, feeds, speeds, depth of cut, clues to tool trouble, and solutions.

The Carbide Seminar, sponsored by ASTE, will be held at the University of Pennsylvania's Towne School, near the Convention Hall.

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Only electric industrial trucks give you the advantage of interchangeable power so that trucks can work while power units are being serviced. With Ready-Power drive you get a double advantage: (1) The quick interchangeability of electric power units, (2) The constant full power of gas-electric or Diesel-electric drive. There are Ready-Power units for all sizes and types of electric trucks. Write for information.

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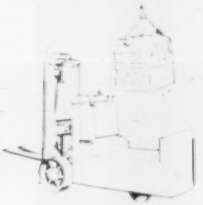
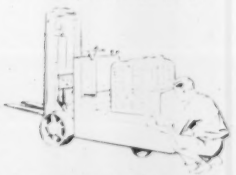
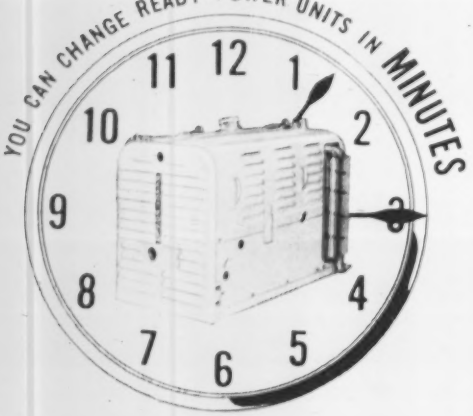


Guide spare Ready-Power unit into position on truck.



Fasten 4 bolts and truck is ready to work.



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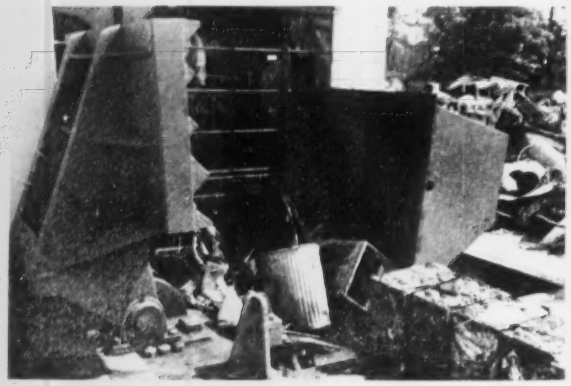
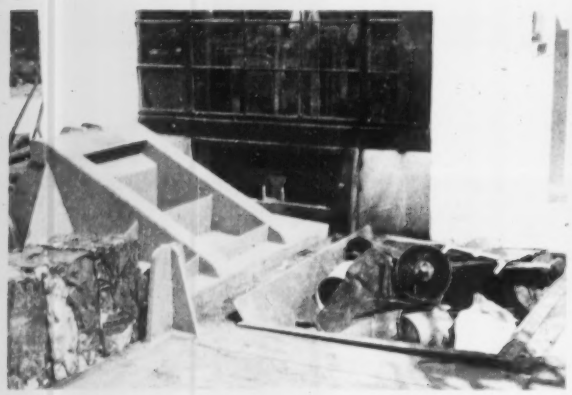
Dempster-Balester's Continuous Operation

shown here by Model 350 at yard Installation



1 With the combination Skip Pan Loader and Auxiliary Compression Door, every phase in a Dempster-Balester's baling cycle is operated by hydraulic controls from the moment scrap is dumped into Skip Pan Loader until finished bale is ejected. Here is a series of photographs made of a Dempster-Balester Model 350 in actual operation. In photo above Skip Pan is dumping scrap metal into charging box.

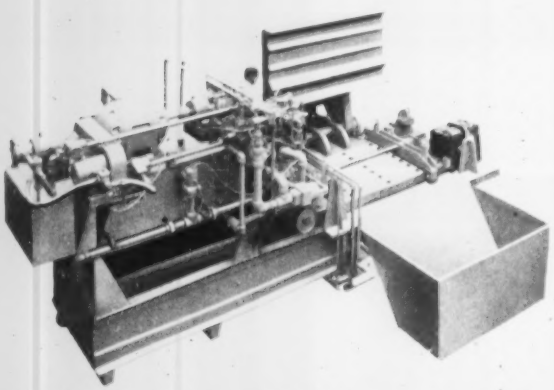
2 Skip Pan returns to be re-loaded. Photo above was made as the Auxiliary-Compression Door came in contact with scrap and crushes it into charging box. This door compresses scrap with one stroke . . . permitting the charging box door to close immediately. This, of course, means a tremendous increase in the speed of the baling cycle with a resultant increase in production. The slow, costly process of manually arranging scrap with the expense of extra men is completely eliminated in most every baling cycle.



3 After compressing the scrap with a 45-ton force, Auxiliary Compression Door returns to up-right position and charging box door closes.

4 Scrap is baled and then ejected. As one cycle ends another begins. Charging box door opens and Skip Pan, which has been re-loaded, dumps another load into charging box (see photo above).

Outlined photograph at left shows a Dempster-Balester Model 350 before installation. The Dempster-Balester's 1-2-3 continuous operation has advanced the scrap metal baling industry many years ahead of normal progress. Without question, Dempster-Balesters are the fastest, most efficient presses baling scrap metal today! And you have six to choose from—three standard and three high speed models that turn out high density bales in capacities to meet any requirement. Write to us for complete information. A product of Dempster Brothers, Inc.



IN CANADA: Sold by W. P. Favorite Co., Ltd., 418 Main Street East and manufactured by Hamilton Bridge Co., Ltd., both Hamilton, Ontario

DEMPSTER BROTHERS, 844 Shea Building, Knoxville 17, Tennessee

WHY WE ARE USING MORE COLONIAL BROACHES

by Plant Superintendent
Oil & Pipeline Valve Manufacturer

We feel that the long record of service we have received from Colonial Broaches should be noted. The company used its first Colonial Broach in 1927, and has been using them in generally increasing numbers ever since.

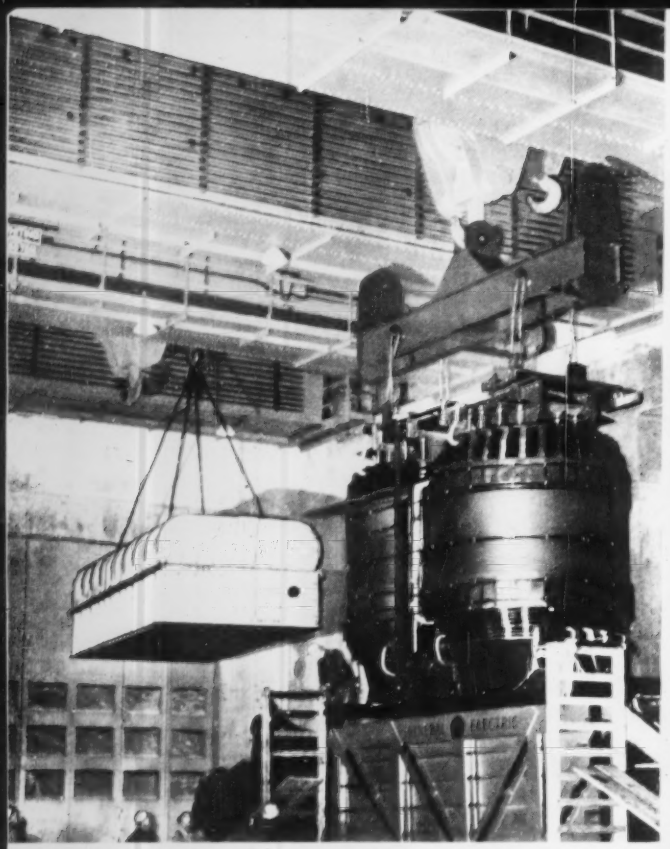
We were particularly gratified with their performance during World War II, when the quality of service, workmanship and material deteriorated in so many products. These broaches were maintained at their usual level in these respects and we were able to operate during this difficult period without broach trouble.

480 BEARING CAPS PER HOUR *with Stationary Broaches*

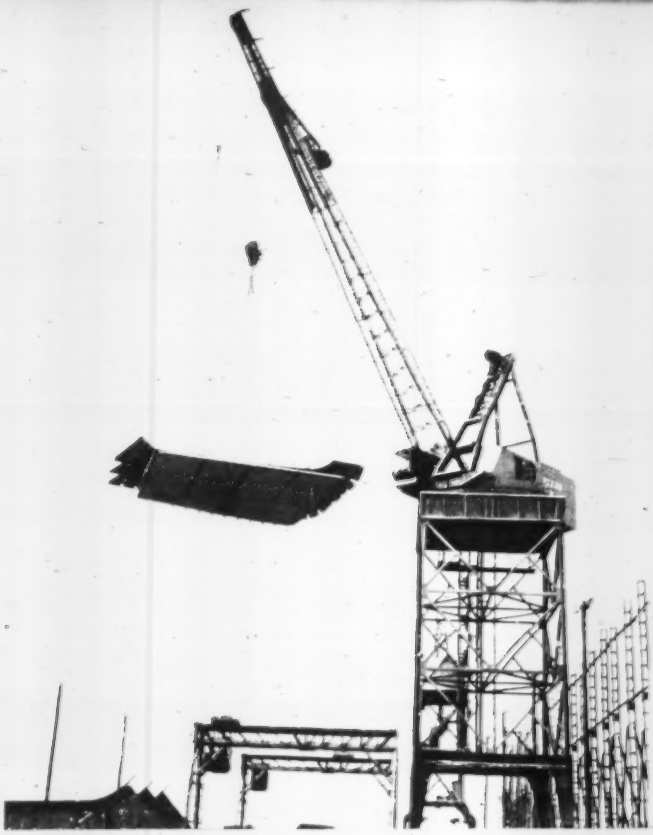
Locating faces on automotive bearing caps are broached at the rate of 480 per hour with this ingenious setup. Bearing caps are guided past stationary adjustable broach inserts. Stock removal is .0045" on each side.

This horizontal Colonial model HB1 4-ton 12-in. stroke broaching machine operates on a semi-automatic cycle, with a maximum cutting stroke of 30 feet per minute. Maximum return speed is 60 feet per minute.

This is a Colonial Unified broaching installation



PINPOINT SPOTTING is easy with a General Electric equipped crane, just as this one delicately positions the core and coils of a large power transformer. At the other extreme . . . .

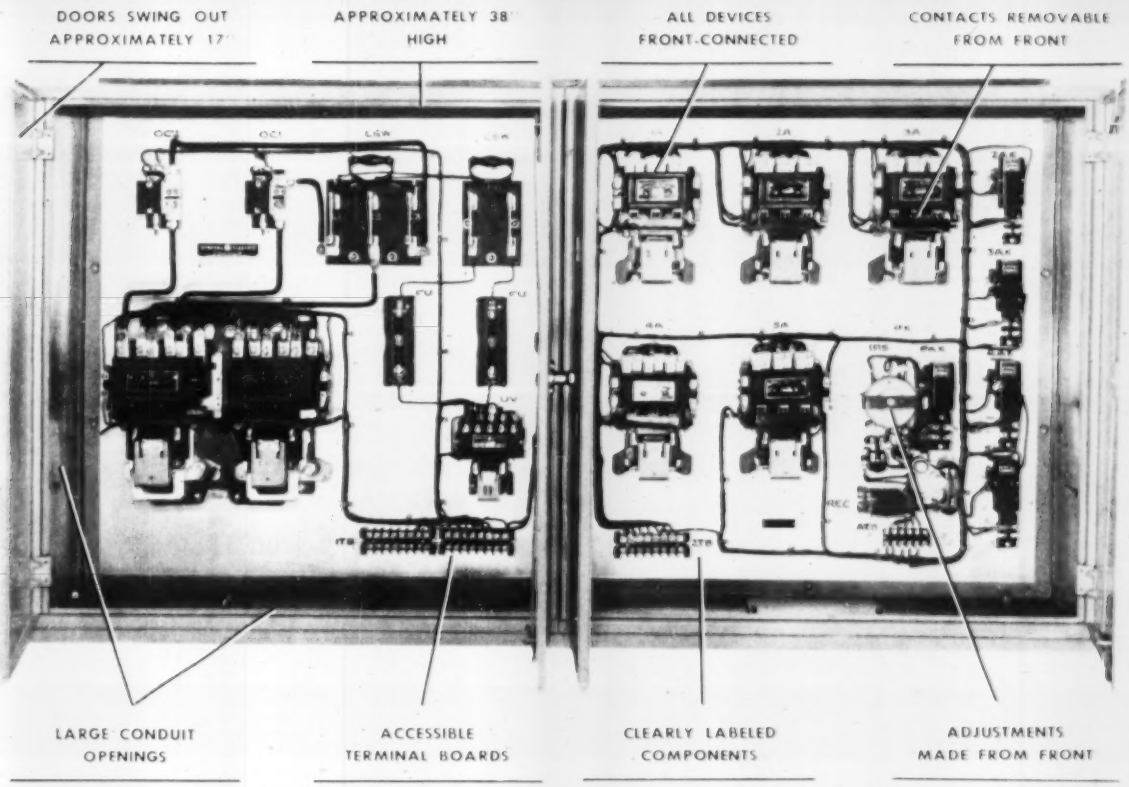


HIGH-SPEED PERFORMANCE is "job-tailored" into this whirly crane control. Each G-E control, built of standard components, is co-ordinated to the crane's characteristics.

New General Electric Control Is

SPECIAL TESTS were performed from this 85-foot outdoor test tower to develop G-E crane control . . . one of the many testing facilities at G-E's modern Schenectady, N. Y. plant.

FIELD ENGINEERING specialists in crane control are always available from G-E, to help apply the technical know-how developed in G-E laboratories to your installation needs.



NEW EASY-MAINTENANCE FEATURES, as well as the proven dependability of the famous G-E "strong-box coil" motor starter, are now built into all G-E controls—here illustrated on a bridge and trolley control. With the addition of the new G-E NEMA II control—NEMA Service Classification for light-duty control), G-E offers a truly complete line.

"Job-tailored" to Your Crane

G-E a-c crane control is tailored to your new crane's operation *at the factory*. G-E engineers, working closely with your crane builder, design and build a control that's perfectly co-ordinated to the crane characteristics. When it's delivered to you, it's ready to operate.

CONTROL RESPONDS INSTANTLY to the operator's directions, guiding the brawn of your crane with a practiced hand. That's because G-E supplies the complete, integrated crane drive, each component designed to match the others right down the line.

RUGGED CONSTRUCTION provides long, dependable service—only routine maintenance required. Adjustments, when desirable, are easily made. All components are standard, and each can be quickly replaced if necessary.

GET G-E STARTED EARLY in working with your crane manufacturer to "job-tailor" a control for your crane. For more information, contact your nearby G-E Apparatus Sales Office, your crane builder, or write Section 780-1 for Bulletin GEA-6112 on G-E a-c crane control and accessories. *General Electric Company, Schenectady 5, N. Y.*

Section D780-1
General Electric Company
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Please send me your new bulletin GEA-6112 which gives complete information on the G-E line of a-c crane control.

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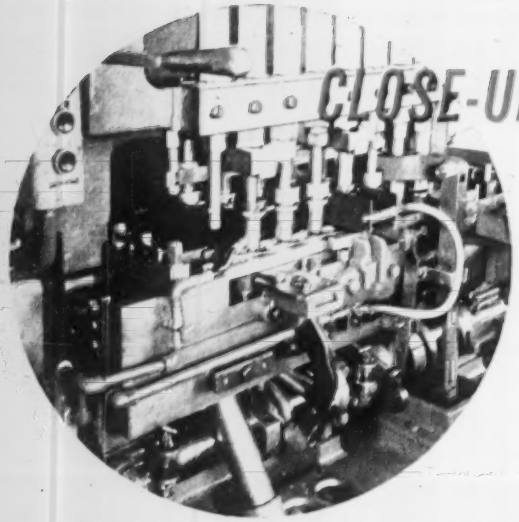


Close-up of an 8-plunger WF cam eyelet machine showing tools and special attachments. Included are a lever type blank holder, a scrap box fitted with a compressed air blower and oscillating shutter, dovetailed punch holders and a hook type side stabber.

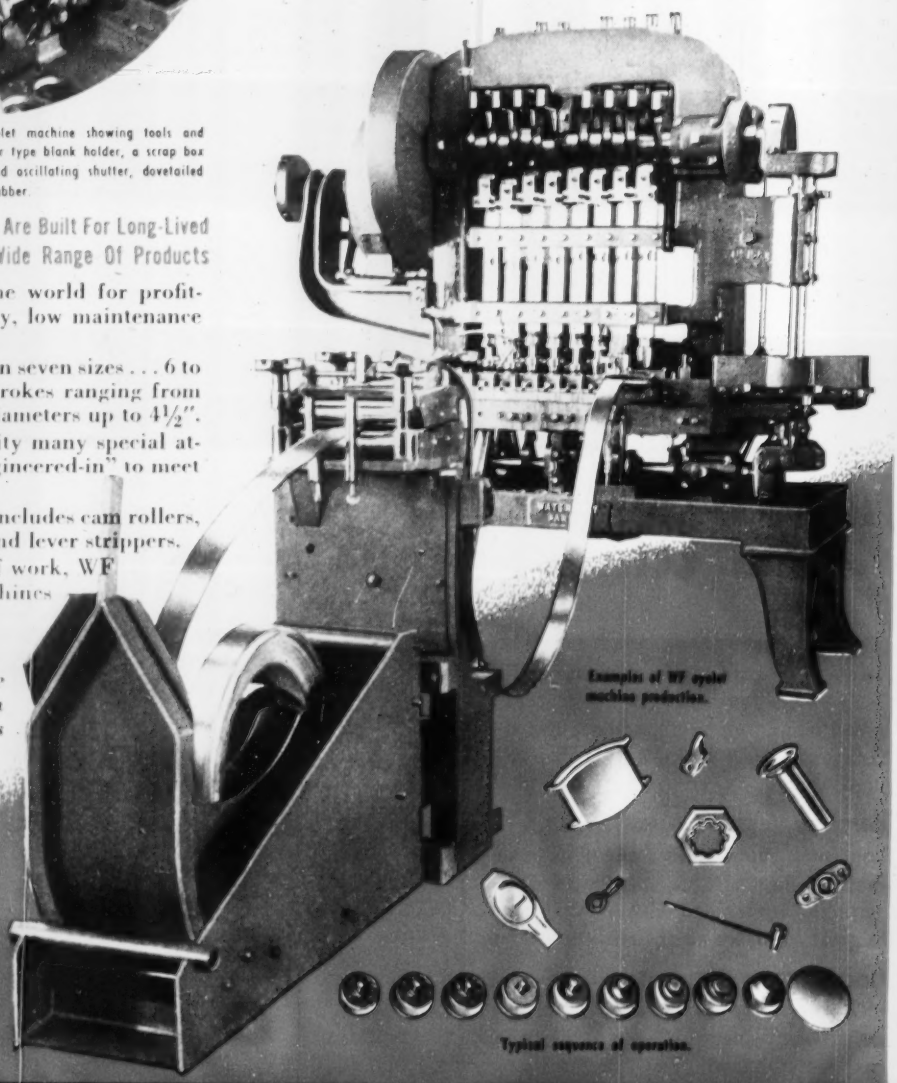
CLOSE-UP of versatile mass-production ability

Waterbury Farrel EYELET MACHINES

WF Multiple Plunger Presses Are Built For Long-Lived Automatic Production Of A Wide Range Of Products

- Known throughout the world for profit-making, high efficiency, low maintenance performance.
- Cam type is available in seven sizes . . . 6 to 12 plungers . . . cam strokes ranging from 1¼" to 6" . . . blank diameters up to 4½".
- For increased versatility many special attachments can be "engineered-in" to meet specific needs.
- Improved WF design includes cam rollers, friction clutch drive and lever strippers.
- For a heavier range of work, WF crank type eyelet machines are available in five standard sizes.

Write today for complete free information on cam or crank eyelet machines or on any of the W F equipment listed below.



Examples of WF eyelet machine production.

Typical sequence of operation.

This WF production unit includes coil box and straightener feeding into an 8-plunger cam eyelet machine.

WF-11

WATERBURY FARREL FOUNDRY & MACHINE CO. • WATERBURY, CONN.

Offices: Chicago, Cleveland and Millburn, N. J.

POWER PRESSES — Crank, Cam and Toggle; also Rack and Pinion Presses • Eyelet Machines • Multiple Plunger Presses • Horizontal and Hydraulic Presses, etc. **MILL MACHINERY** — Rolling Mills: Strip, Rod, Wire Flattening, (For Ferrous and Non Ferrous Metals) • Also Slitters • Straighteners • Cut-off Saws • Coilers • Winders, etc. **WIRE MILL EQUIPMENT** — Continuous Wire Drawing Machines (Upright Cone and Tandem) • Wire Flattening Mills • Chain Draw Benches • Pointers • Swagers • Bull Blocks • String-up Machines • Spoolers, etc. **COLD PROCESS BOLT & NUT MACHINERY** — Headers (all types) • Rivet Machinery • Trimmers • Thread Rolling Machines • Slotters • Nut Formers and Tappers, etc.

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Reliant Industries, South Gate, Calif. ... 526
Rezolin Inc., Los Angeles ... 1914
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Rotor Tool Co., Euclid ... 1216
H. B. Rouse & Co., Chicago ... 643
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Royal Oak Tool & Machine Co., Royal Oak, Mich. ... 221
Joseph T. Ryerson & Son Inc., Chicago ... 638
S-P Mfg. Corp., Cleveland ... 806
Sablin Engineering Co., Birmingham, Mich. ... 406
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Salvo Tool & Engineering Co., Roseville, Mich. ... 2071
Sandvik Coromant Division, Sandvik Steel Inc., Detroit ... 2011
Schauer Mfg. Corp., Cincinnati ... 1637
George Scheer Co. Inc., New York ... 516
A. Schrader's Son Division, Scovill Mfg. Co. Inc., Brooklyn ... 724
Schramm Inc., West Chester, Pa. ... 1230
Scully-Jones & Co., Chicago ... 1530
Seibert & Sons Inc., Chester, Ill. ... 432
Sentry Co., Foxboro, Mass. ... 534
Service Diamond Tool Co., Ferndale, Mich. ... 101
Service Machine Co., Chicago ... 1716
Severance Tool Industries Inc., Saginaw, Mich. ... 814
Shear Speed Chemical Products Division, Michigan Tool Co., Detroit ... 107
Sheffield Corp., Dayton, O. ... 324
Sheldon Machine Co. Inc., Chicago ... 812
Sheridan Products Inc., Inglewood, Calif. ... 522
Siewek Tool Co., Detroit ... 105
Simonds Abrasive Co., Philadelphia ... 514
Simonds Saw & Steel Co., Fitchburg, Mass. ... 514
Simplex Machine Tool Corp., Milwaukee ... 1444
Size Control Co., division of American Gage & Machine Co., Chicago ... 332
Skinner Chuck Co., New Britain, Conn. ... 1810
Anton Smit & Co. Inc., New York ... 104
Sonny Vacuum Oil Co. Inc., New York ... 1527
Sorensen Center-Mikes Inc., Bridgeport, Conn. ... 234
South Bend Lathe Works, South Bend, Ind. ... 1709
Spiral Step Tool Co., Chicago ... 1534
Standard Electrical Tool Co., Cincinnati ... 538
Standard Gage Co. Inc., Poughkeepsie, N. Y. ... 238
Standard Parts Co., Bedford, O. ... 811
Standard Pressed Steel Co., Jenkintown, Pa. ... 1429
Staples Tool Co., Cincinnati ... 207
L. S. Starrett Co., Athol, Mass. ... 211
Steel City Testing Machines Inc., Detroit ... 1316
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Edwin B. Stimpson Co. Inc., Brooklyn, N. Y. ... 1201
Stone Machinery Co. Inc., Syracuse, N. Y. ... 511
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By improved paint base: Paintbond provides greater permanence to your paint finishes than any comparable phosphate coating process . . . you can prove this with your own salt-spray tests! Even when paint is scratched through, corrosion is confined to the exposed metal; spreading corrosion, and resulting paint flaking and peeling, is prohibited!

Further, since Paintbond consists of much finer-grained crystalline structure, it imparts a smoother, more lustrous finish to your products. At the same time, paint is securely interlocked with the metal for extreme durability.

By dollar savings: It is an easily proven fact that Detrex Paintbond will coat a substantially greater surface area per drum of compound, or will provide a heavier coating with the same amount of compound. This means important dollar savings for you. Since Paintbond goes further and is easier to control in solution, you enjoy maintenance savings, too.

By flexibility: Whether applied by spray or immersion, Paintbond can easily be controlled to give exactly the coating weight and crystal size you desire. This important advantage spells satisfaction on every type of product and application.

By added merchandising value: Detrex makes available to Paintbond users an attractively designed sticker for application on their finished products. At point of sale, this sticker becomes another sales clincher for your product as it informs the customer of the life-time, rust-free paint finish that Paintbond provides.

Paintbond *IS* different . . . the benefits above are but a few reasons why. Like all Detrex processes, results are fully guaranteed. You can get *all* the facts by using the coupon below . . . do it today for better paint finishes at lower cost tomorrow.

Please send us complete facts about Paintbond and how it will improve our finishes while cutting our costs.

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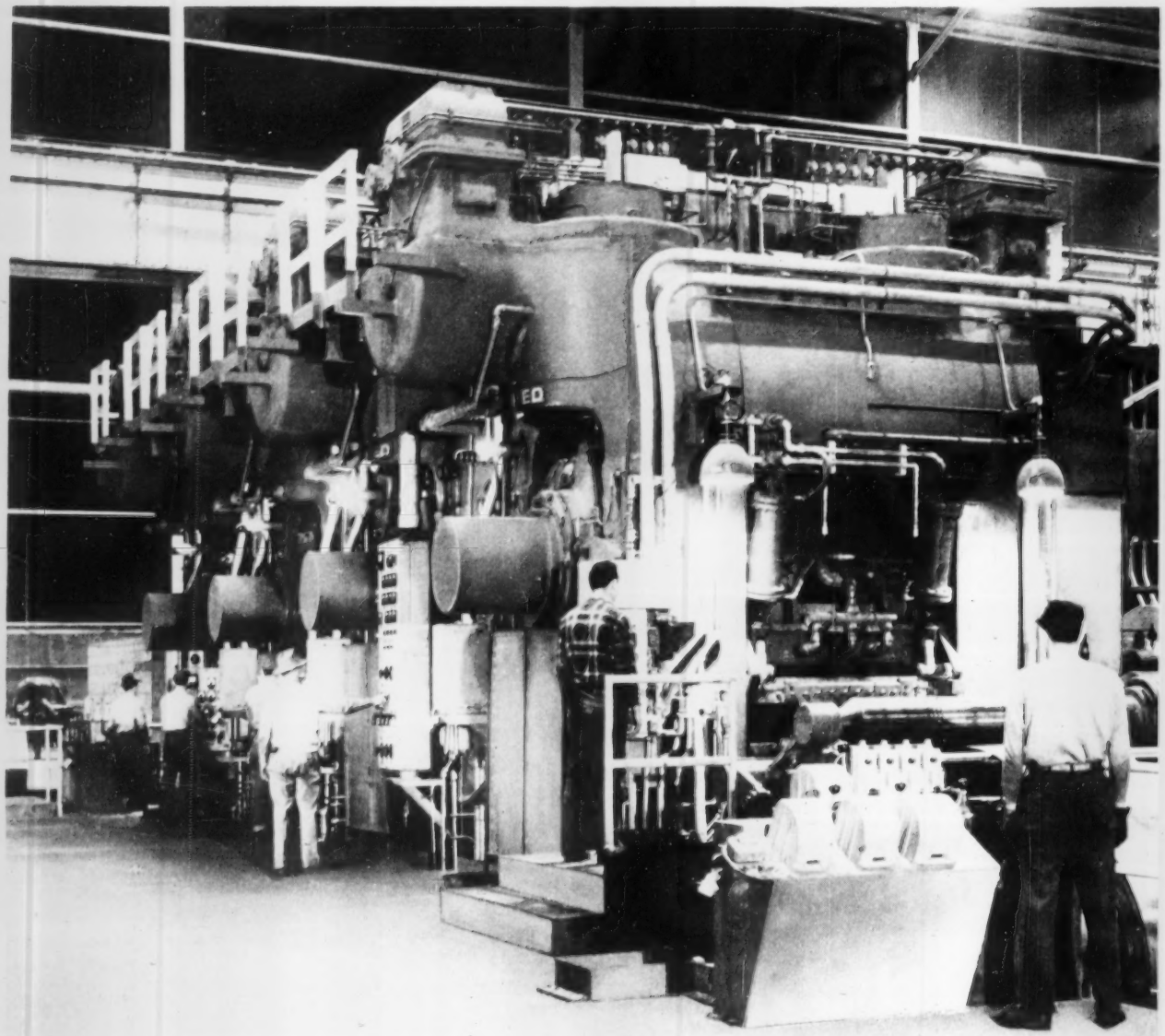
DEPT. PB-101, BOX 501, DETROIT 32, MICH.

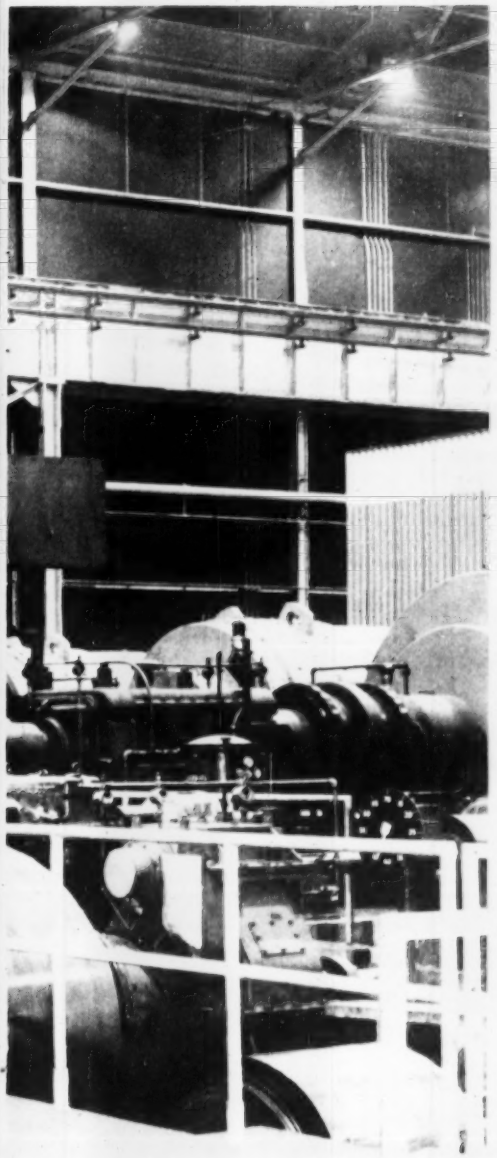
Youngstown now offers cold-reduced



THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

sheets and strip from its Indiana Harbor Works



THIS new continuous cold-reduced sheet mill at East Chicago, with a monthly capacity of 40,000 tons, is now in production and increasing output daily. Orders for sheets and strip, up to 50" wide, are now being booked.

Completion of this mill is the latest step in a series of major additions and improvements at our Indiana Harbor Works since the war, representing an investment of many millions of dollars.

Backed by a completely modernized steel plant, the new mill is ready to serve your needs, no matter how large or small. Write or phone our nearest District Sales Office for further information.

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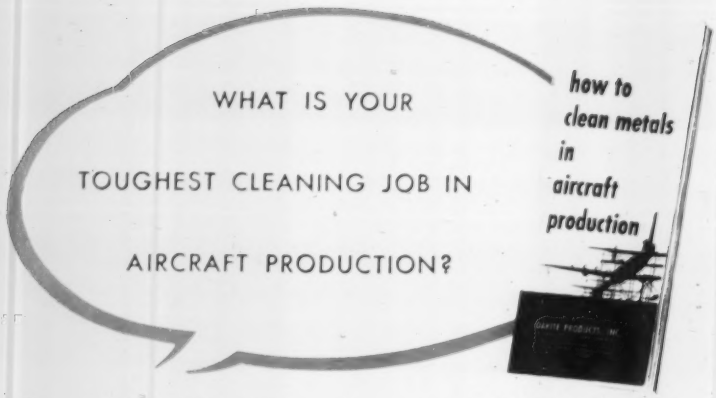

Does any job in the following list give you trouble? If you'll circle the corresponding number in the coupon, we'll be glad to tell how we can help you.

This list of cleaning (and related) jobs was made up with the advice of several of our customers in aircraft production. It shows, in order of volume, the jobs on which Oakite has most frequently been able to save them time and money. Here it is:

1 Cleaning aluminum, steel and magnesium
2 Stripping paint (solvent or hot tank)
3 Machining, grinding, forming
4 Deoxidizing aluminum
5 Steam cleaning aluminum and steel
6 Deflocculating paint in spray booths
7 Preparing metal for painting
8 Removing scale and corrosion
9 Preventing corrosion

FREE Our 48 page illustrated booklet *"How to Clean Metals in Aircraft Production"* contains information on all the cleaning jobs in the list.

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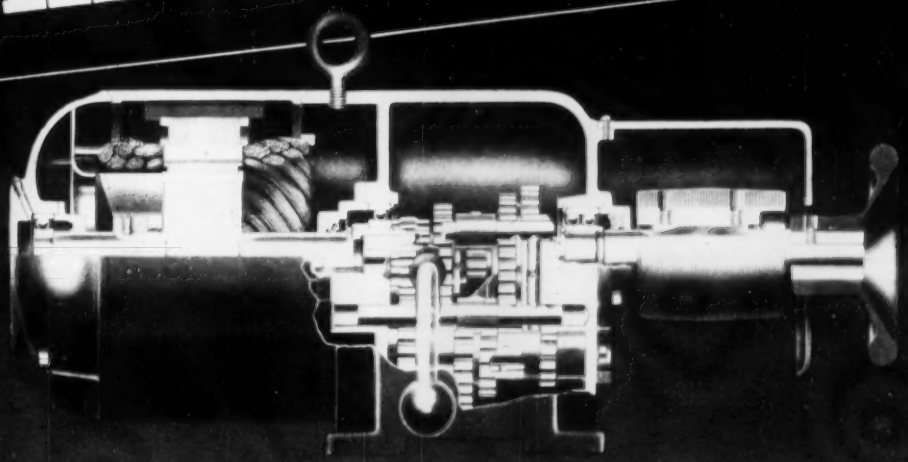

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LIMA GEARSHIFT DRIVES provide an individual power source for machine tools and other equipment wherever constant horsepower and multiple speeds are required. The modern LIMA *Selective Speed* DRIVE is a compact combination of a four-speed sliding gear transmission and a heavy-duty induction motor. For increased production, lower operating costs, minimum maintenance and maximum safety . . . specify Lima Drives. Experienced Factory Representatives are in the field to give your drive problems immediate and *personal* attention. Write today for the New brochure on Lima Gearshift Drives . . . ½ to 15 Horsepower.

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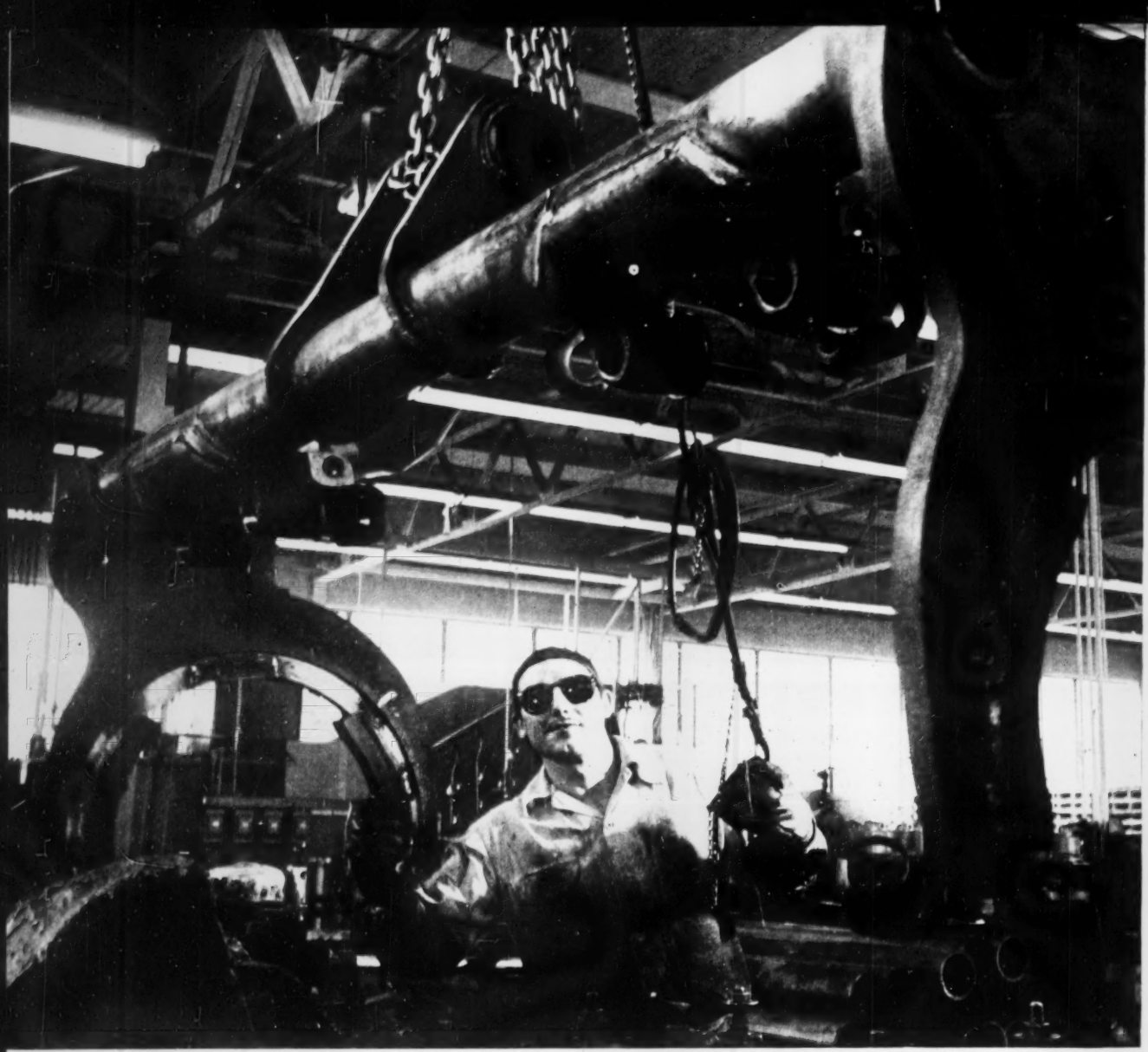


This tough, strong, cold drawn, 69-inch length of . . .

Pittsburgh Seamless Steel Tube Is The Giant Kingpin of Budd's Revolutionary Disc Brake

Stopping 70 to 80 tons of fast moving railroad car safely, quickly and efficiently without pitching passengers out of their seats has long been a goal of railroads and car builders alike. Budd Company, after years of research, came up with the answer in the revolutionary Budd Disc Brake. It is built around a 69-inch length of the finest grade Pittsburgh Seamless Steel Tubing which acts as the giant "kingpin" in absorbing all the stress and strain of the braking reaction.

Here's how it works! Old style brakes had shoes which were applied directly to the wheels' surface. The new Budd Disc Brake has a large, cast iron disc mounted on the inboard side of each wheel. Controlled friction is applied to both sides of these discs by two sets of air operated brake shoes.

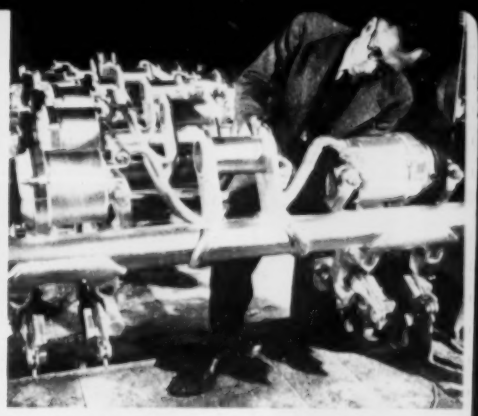
Here's the difference! When old style brakes were applied suddenly, passengers were jolted—and damaging heat generated in the wheels. With the Budd brake, wheels do only the jobs they were originally designed to do—support and guide the car along the rails. They do not have to act as brake drums.

Instead the brake drum function has been transferred to the air cooled disc, precisely engineered to do that

(Advertisement)

Uniform physicals make possible operations like expanding, welding, and stress relieving of welds at Budd's Red Lion plant near Philadelphia.

The most modern type air cylinders, brake shoes, and other vital parts of the disc brake assembly are installed in this production line . . .



A rigid, final inspection is given the completed brake assembly now aluminum painted and ready for installation on train trucks . . .

important job alone. Stopping is so smooth and chatter-free even under emergency application that passengers are barely aware that the brakes are being applied.

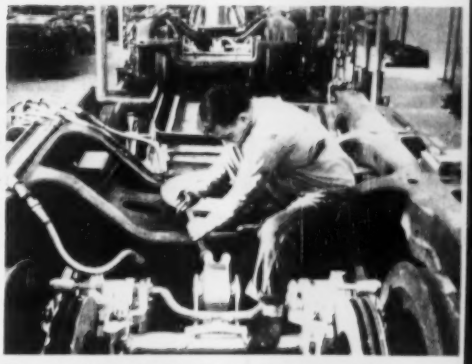
The results are as follows! Because passenger comfort has been increased and maintenance costs reduced, old style brakes are rapidly being replaced by The Budd Company's Disc Brake on America's fastest, most modern trains. Disc brakes are easier to service, cost an average of $1,000 less per car, per year to maintain. They save nearly a ton of dead weight per car, have half as many pins and bushings to service as brakes using the wheel as the brake drum. Brake shoe life is increased 10 to 20 times!

Above all, the Budd Disc Brake is safe. It is standard equipment on Budd's new self-powered, economical Rail Diesel Car (RDC) which is reviving railroad travel in metropolitan areas by greatly reducing operating and maintenance costs.

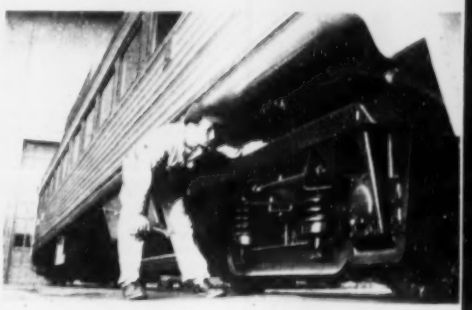
Inherent quality helps make this possible! Passenger safety and comfort and increased braking efficiency, possible with the new Budd brake, stems from brilliant design engineering and high quality of component parts. For example, Pittsburgh Cold Drawn Seamless Steel Tubing was selected for its high strength-for-weight ratio, for weldability, for close tolerance and smooth surface finish. It provides the giant "kingpin" which has an ultimate strength of 77,000 pounds per square inch—more than enough to absorb the tremendous torsion and bending stresses of the braking reaction.

All of the load of the braking reaction is carried through the "kingpin" seamless steel brake frame tube to the hanger on the railway car truck, and to the outside bearing arms. This application of Pittsburgh Cold Drawn Seamless Tubing is typical of its many vital uses in the aviation, automotive, machine tool, agricultural implement and other industries.

Pittsburgh Seamless Cold Drawn Tubing might be the "kingpin" in reducing costs and improving the products you manufacture. Why not consult a Pittsburgh Steel representative? He may have a suggestion that can save both you and your customers time and money. Write for complete information regarding Pittsburgh Seamless Cold Drawn Tubing.



Four bolts attach the assembly to the hanger box, which is welded to truck . . .



Now installed and ready to roll on one of Budd's self-powered Rail Diesel Cars (RDC), the Budd Disc Brake greatly reduces maintenance costs while improving braking and providing greater passenger comfort.

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Finishing Forgings

Carbide insert tooling is accounting for 54 machined forgings before regrind

INTERRUPTED CUTTING of tough heat-treated SAE 4340 alloy steel forgings is being handled at an increased speed and with more than ten times longer tool life by a switch from standard brazed tools to Kennametal sintered tungsten carbide triangular insert tooling.

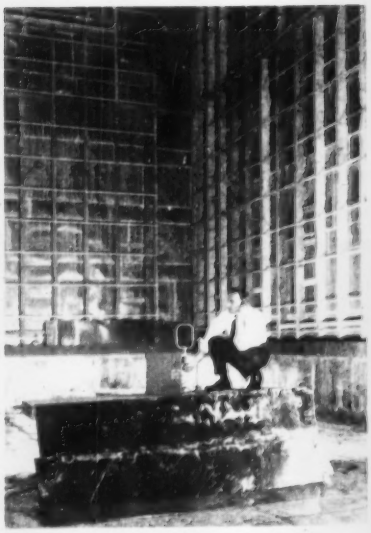
Operation is being performed by Menasco Mfg. Co., Burbank, Calif., manufacturers of aircraft landing gears. Operation consists of rough and finish facing both sides of a star-shaped 11-inch diameter forging on a 10-hp Warner & Swasey No. 2A turret lathe.

This job was previously performed with various grades of standard style GR-16 tools, at 87 rpm, 0.0035-inch feed and 0.030 to 0.095-inch depth of cut. Even at this relatively low speed and feed, best tool life obtained was only two to four pieces per grind. Three cuts were required for each side.

Speed and Feed Increased — Standard style TFR-16A, grade K5H triangular insert tools are now used for the rough cut at 101 rpm, 290 sfm and for the finishing cut at 134 rpm, 385 sfm. Feed used is now 0.0075-inch per revolution, twice that previously utilized.

Two cuts for each face of the workpiece are required. Depth of cut on roughing is 0.030 to 0.125-inch and 0.030-inch on finishing. Under these stepped-up operating conditions, nine pieces are machined before any indexing is required. Three cutting edges are available on each end of the triangular insert. Both sides of 54 pieces are faced before regrinding of the tungsten carbide tool is necessary.

Indexing—Changing time for previously-used tooling was 6.35 minutes. Time for indexing or rotating the triangular carbide insert tool to a new cutting edge is now only 45 seconds. To regrind the brazed tool required 15 minutes. Now, both ends of the Kennametal inserts are reconditioned in 10 minutes production time.



No Interference Here

Copper-lined room will become a part of test and research facilities at General Electric Co.'s transformer plant in Pittsfield, Mass. Copper is a shield for keeping out electromagnetic waves of external origin. Concrete, masonry and Fiberglass wedges, plus the 20,900 pounds of copper, are employed in the 4½-foot-thick walls

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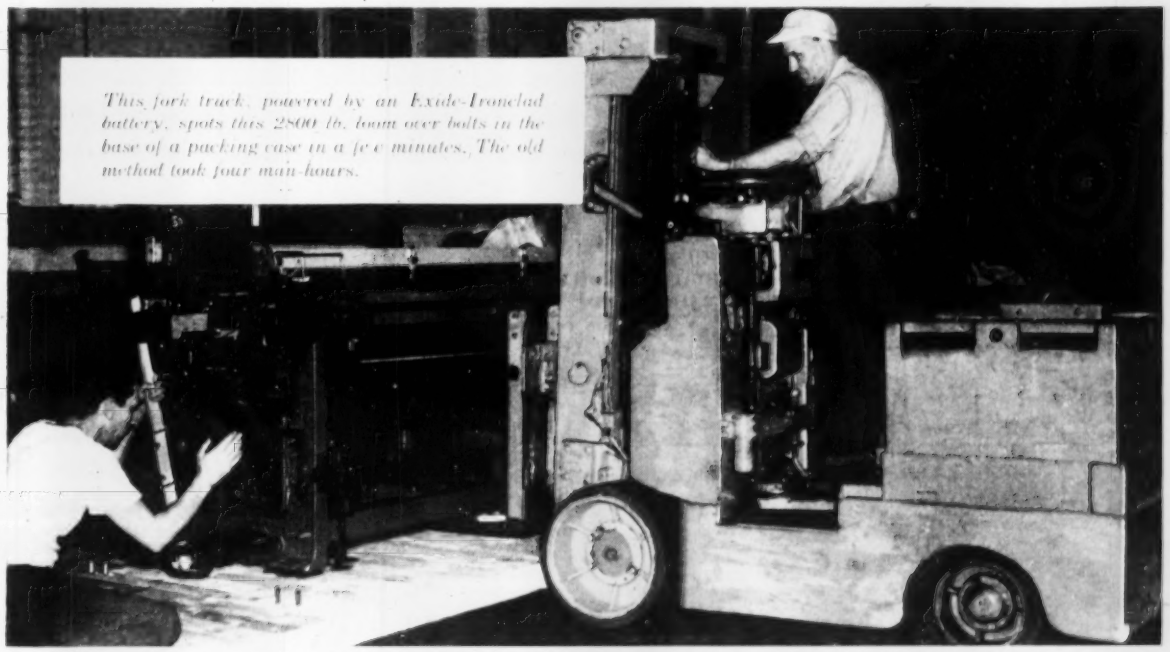
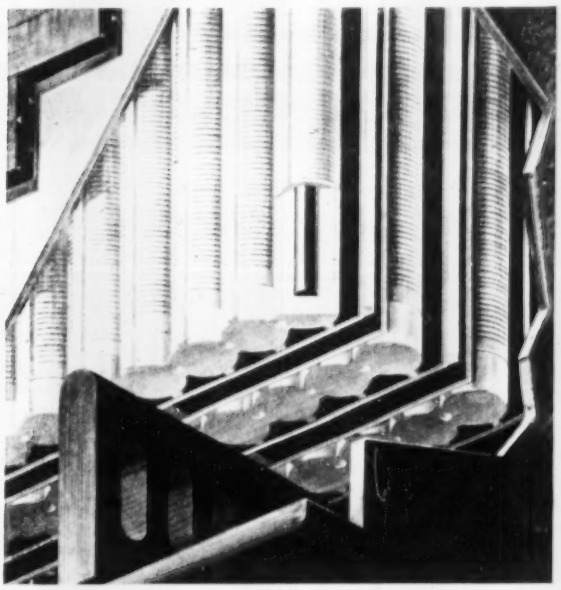
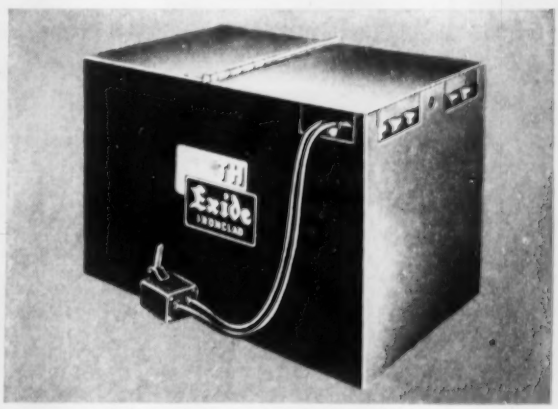


This fork truck, powered by an Exide-Ironclad battery, spots this 2800 lb. loom over bolts in the base of a packing case in a few minutes. The old method took four man-hours.

YOU GET fast, safe and low cost handling when your lift trucks are powered by dependable Exide-Ironclad batteries. In addition, these rugged, long life batteries assure full-shift operations and high availability of equipment. Lower costs for operation, maintenance and depreciation make Exide-Ironclads your best power buy — AT ANY PRICE!



THE POSITIVE PLATES are the heart of any battery. Only Exide uses a slotted tube construction. By use of tubes, more active material is exposed to the electrolyte, providing *greater power*. Also, more active material is retained, giving *longer working life*.



THE NEW THRIFTY HAULERS! The improved industrial truck battery using *non-oxidizing* plastic power tubes for longest battery life, more capacity in the same space. For full details, call your Exide sales engineer — write for Form 1982 (Installation and Maintenance of Motive Power).

Your best power buy ...AT ANY PRICE!

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IRONCLAD BATTERIES

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LOOK AT THE FEATURES OF THIS NEW CRANE!

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- Adequate end bracing and large gusset plates keep crane square and girders plumb.
- Liberal safety factors . . . girders, ropes, bearings, gearing, motor sizes.
- Sealed lubrication on all roller bearings.
- Enclosed controls keep out mill dirt and, as located on foot walk, provide maximum accessibility.
- Operation easily and accurately controlled. Operator's cab located at center of bridge gives best visibility.
- One-piece welded trolley frame.
- All-steel construction including cast steel drums.

For over half a century leading mill designers and builders for heavy industry have turned to The Alliance Machine Company for dependable heavy-duty cranes. Alliance has constantly pioneered mechanical features which are accepted today as conventional. Alliance can develop equipment best suited to your company's particular heavy material handling needs. Write for full information.

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Alliance Standard Steel Mill Crane in the Cold Strip Reduction Department of the Fairless Works, U. S. Steel Corporation. This standard overhead crane has a 100-ft. span, with a 90-ton main hoist and 30-ton auxiliary hoist.

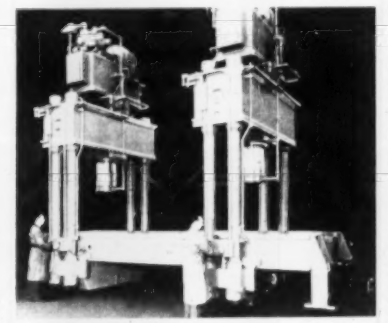
NEW PRODUCTS and equipment

Reply card on page 205 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Straightening Press

. . . with 400-ton capacity

A two-way straightening press with two pressure units is designed to straighten parts such as forgings, castings, extrusions and weldments where it is necessary to hold down one point while applying pressure to another point;



or to apply pressure at two points simultaneously. Spot pressure can be applied over practically the entire press bed area because the two units have both longitudinal and traverse movement.

Each pressure unit has a pressure capacity of 400 tons. The bed is 264 inches long and 96 inches wide. From each ram nose (ram up) to the bed is 60 inches and each ram has a 24-inch stroke. Hydraulic Press Mfg. Co.

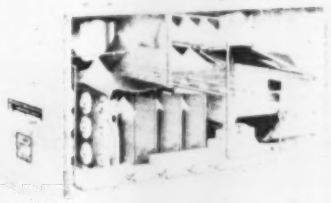
FOR MORE DATA CIRCLE NO. 1 ON REPLY CARD

Dust Removal System

. . . reduces dust to sludge

A new type liquid precipitating stack gas scrubber has been developed for installation in low cost housings of cinder block, concrete or fabricated steel.

The housing for the system can be built as a permanent installation or as a portable unit. All connections are made conveniently to existing ducts with no need for complicated piping. Neither cloth



bags nor filters are used. All dust removed from the air is reduced to a watery sludge which can be discharged into a tank or pond for easy removal of the solids. A recirculating system can be used.

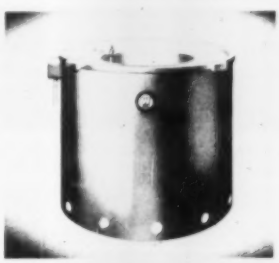
Eight models are available that can handle high temperature gases in capacities ranging from 8000 to 60,000 cfm. Johnson-March Corp.

FOR MORE DATA CIRCLE NO. 2 ON REPLY CARD

Electric Melting Pots

. . . bricks reduce heat-up time

Automatic electric melting pots for soft metals are widely used in preparing metals for bearing, tinning and soldering of electrical connections.



Accurate temperature control of molten metal is provided by a thermostat bulb immersed in the metal and protected by a cast iron tube. Heating elements for 150 to 860-pound capacity pots consist of spirally wound coils of nickel-chromium wire threaded through ceramic insulator supports to form a flexible band.

On larger pots, the helical coils are spaced and supported by refractory insulators bolted together and fastened to the heavy alloy top ring casting to form a separate unit which can be removed. Westinghouse Electric Corp.

FOR MORE DATA CIRCLE NO. 3 ON REPLY CARD

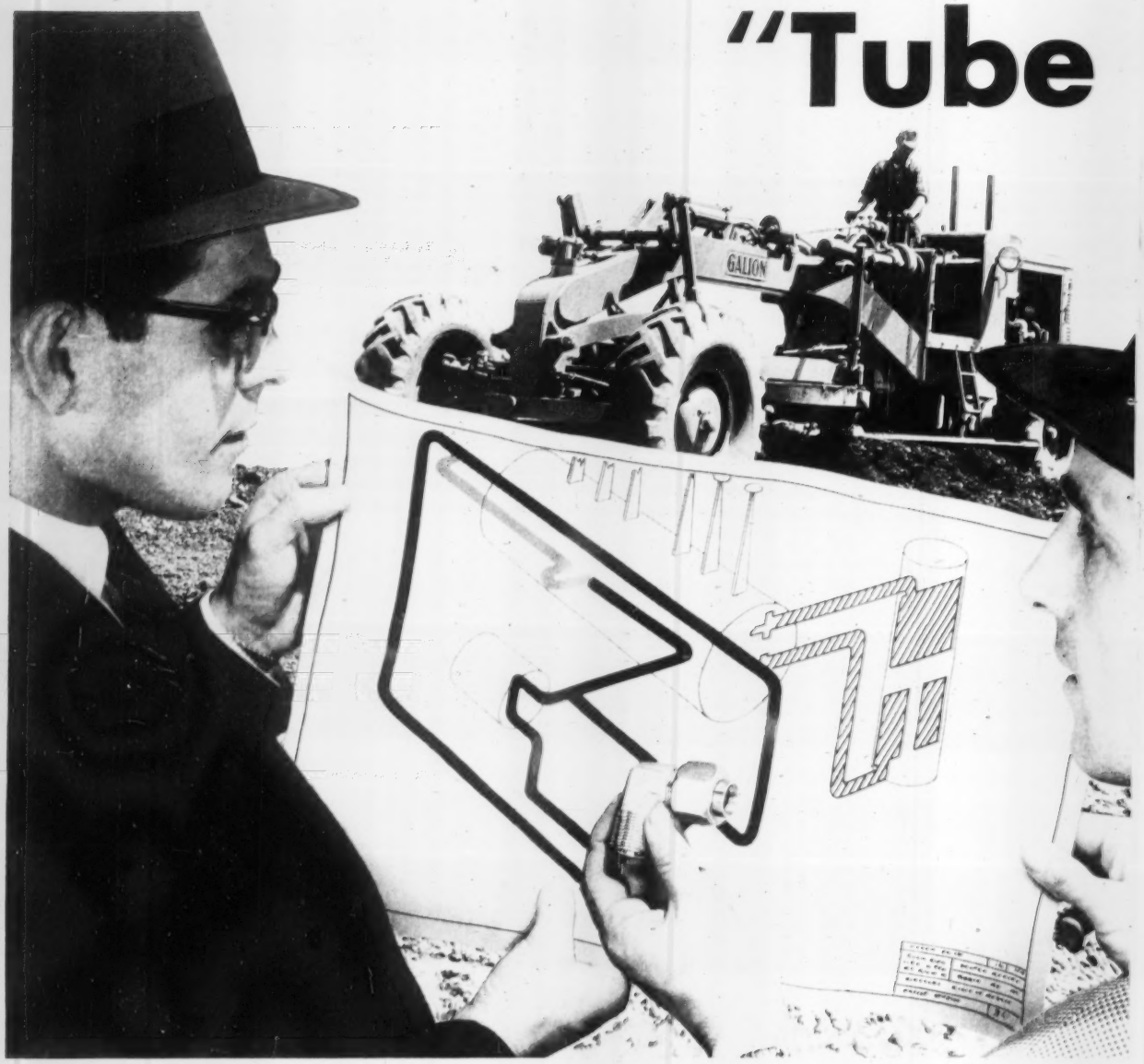
Automatic Grinder

. . . can use standard attachments

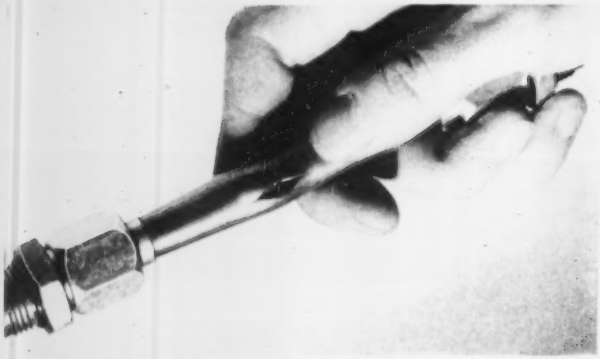
A precision surface grinder, the model D10, offers greater capacity than previous Do-All models. Furthermore, the large capacity is

readily utilized for production flat or form grinding and the machine is designed to receive standard attachments to make such production grinding automatic. With the D10, formed parts can be mass produced with precision, comparable to tool room made parts. A

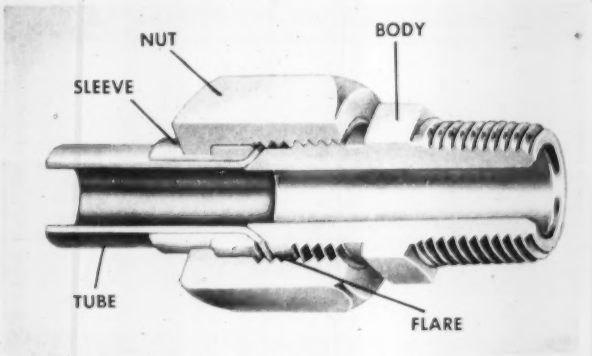
"Tube



Design engineers at the Galion Iron Works and Manufacturing Co. of Galion, Ohio, developed a simple, foolproof hydraulic control system for their line of motor graders. It offers a high degree of accuracy, safety, and dependability and has proved to be an outstanding success. One reason: Galion engineers specified Parker *Triple-lok* fittings for every grader they build.



At tube-bursting pressures Parker *Triple-lok* fittings remain intact with absolutely no leakage or distortion. They also hold leakproof over ranges of extremely hot and cold temperatures.



3-piece *Triple-lok* fittings are stocked by distributors in steel, stainless steel, brass and aluminum alloy. They are also available in other materials on special order.

up and forget it"

Use leakproof Parker *Triple-lok* fittings for trouble-free equipment

This motor grader, like most mobile equipment, takes severe punishment during its daily work. Jars and jolts; stresses and strains! Hydraulic control systems must be extra safe and dependable. That's why more and more manufacturers of lift trucks, agricultural and earth-moving machinery are specifying leakproof Parker *Triple-lok* fittings.

These flare fittings are absolutely leakproof even under the severest conditions of vibration, shock, and hot and cold temperatures. Thousands of destruction tests prove they will hold pressures that burst the tubing.

Using *Triple-lok* fittings is the easiest and best way to tube up your equipment. You get low assembly torque, easy disconnection, and repeated reassembly for trouble-free joints.

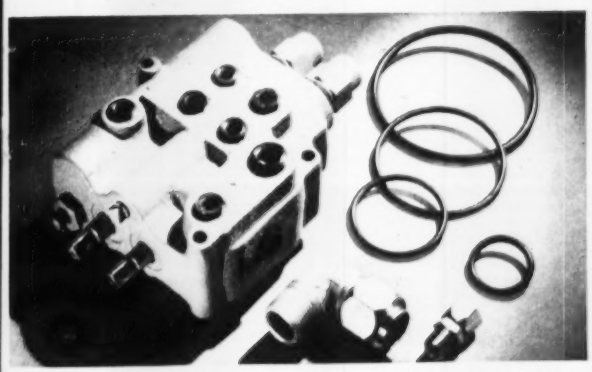
These fittings meet J.I.C. and S.A.E. standards plus specifications of the A.S.M.E. Code for Pressure Piping.

As a matter of fact, *Triple-lok* is the standard of industry. More *Triple-lok* fittings are used on industrial machinery than any other fitting.

So, tube up and forget it. Specify *Triple-lok* fittings for the equipment you build. Parker offers the widest range of shapes and sizes available . . . for tubing outside diameters from ⅛ through 2 inches. Mail the coupon for complete fitting data.

TUBE AND HOSE FITTINGS DIVISION
The Parker Appliance Company
17325 Euclid Avenue, Cleveland 12, Ohio

Parker
Hydraulic and fluid system components



What other Parker products for hydraulic and fluid systems interest you? Ferulok flareless fittings? New hydraulic control valves? Synthetic rubber O-rings?

TUBE AND HOSE FITTINGS DIVISION
The Parker Appliance Company
Section 403-N
17325 Euclid Avenue
Cleveland 12, Ohio

Please send Parker fittings catalog No. 4302
Please send descriptive literature about . . .

NAME TITLE

COMPANY

ADDRESS

CITY STATE

Mail this coupon for catalog of complete information about Parker tube fittings . . . the standard of industry. If you'd like to know about other Parker products, please list them on the coupon.

flip of the switch turns the machine back to manual operation.

Other features: Crush form grinding table control; automatic skipfeed; automatic downfeed; automatic crossfeed reverse. DoAll Co.

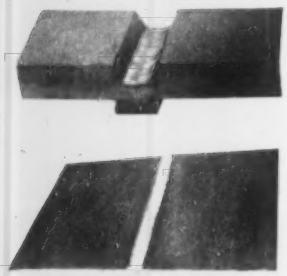
FOR MORE DATA CIRCLE NO. 8 ON REPLY CARD

Electrode Line

. . . with powdered metal coats

The second electrode in Lincoln's line of electrodes with powdered metal coatings is announced.

Jetweld 2 is designed for high-speed welding of butt and deep groove joints to weld at the lowest



possible cost per foot, with excellent x-ray qualities, easy slag removal, good physical properties, smooth appearance and low crack sensitivity.

Lincoln reports Jetweld 2 will weld butt and deep groove joints up to 50 per cent faster than conventional electrodes. It operates on either ac or dc, with operations on ac preferred. Lincoln Electric Co.

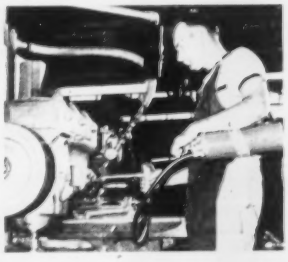
FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

Portable Lubricator

. . . filled, weighs 15 pounds

An air-primed portable lubricator, called Aro-Pak, enables the operator to use air power instead of muscle in lubricating complicated machinery or hard-to-reach fittings anywhere.

It consists of a cylindrical tank holding 5 pounds of grease, a carrying strap, hose and control nozzle. A hand pump primes the unit. Other features include: Visual grease level indicator; volume control nozzle; full swiveling; pressure booster feature. A companion unit, the Aro-Fil, enables



the user to quickly and easily fill the Aro-Pak or any hand gun. Aro Equipment Corp.

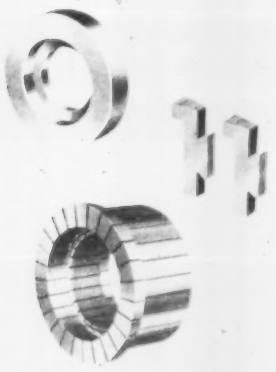
FOR MORE DATA CIRCLE NO. 10 ON REPLY CARD

Electric Motor Parts

. . . produced from sintered metal

United States Graphite is now producing Gramix sintered metal commutator segments, slip rings, pole shoes and bearings for electric motors.

Gramix electric motor parts are



compacted under pressures up to 70,000 pounds and sintered in controlled atmosphere furnaces. They are said to cost less to produce and give better performance and longer service than machined parts. A relatively high density provides intimate contact for good conductivity. Parts can be impregnated with a variety of fluids during manufacture to give longer wear with little maintenance. United States Graphite Co.

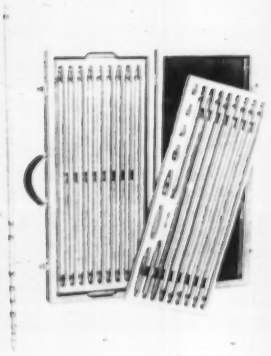
FOR MORE DATA CIRCLE NO. 11 ON REPLY CARD

Inside Micrometer

. . . readings to 30 feet

An inside micrometer capable of high accuracies in lengths up to 30 feet is offered by Brown & Sharpe.

The instrument has a minimum reading of 6 feet and a maximum of 30 feet; it will measure any dimension between. A special micrometer head and 25 extensions, used in combination, permit this broad coverage. Each extension is calibrated to the nearest ten-thousandth, permitting excellent overall accuracy. For portability, the



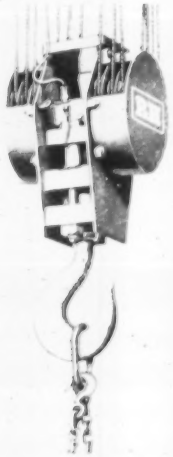
entire set is packaged in a carrying case. Brown & Sharpe Mfg. Co.

FOR MORE DATA CIRCLE NO. 12 ON REPLY CARD

Crane Scale

. . . weighs during handling

Hook-a-Weigh is the name given to an electronic weighing device developed by P & H Overhead Crane Division. Designed for



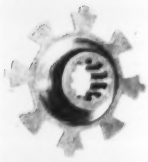
overhead cranes, it provides accurate weighing service for any type of load while it is being handled.

The need for a separate weighing operation in many cases is eliminated, with products moving

How the design, development and production team at Burgess-Norton made possible

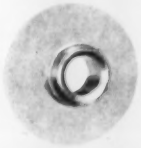
Cost Savings of 17% On this Clutch Hub

Here is another example of how redesign for modern production methods produced a better part at lower costs. This clutch hub was formerly made from a machined forging. By combining a screw machined part and a stamping through hydrogen-copper brazing, as shown below, production costs were reduced 17% . . . greater control on flange tolerances obtained, and eight stop lugs could be used instead of only four.



The original forged hub design required greater machining time, and often had excessive scrap because of flange thickness variations.

Basic components of the new design are a stamped and formed flange and a screw machined center hub.



The two parts are then assembled with copper rings and brazed under controlled atmosphere conditions to eliminate oxidation.

After the hydrogen-copper brazing operation, the hub splines are cut on horizontal broaching machines.

Final operations are in the stamping department, where spring slots are pierced and stop lugs formed.

COMPLETE FACILITIES
FROM DESIGN THROUGH PRODUCTION FOR BETTER PARTS AT LOWER COSTS

Engineering is one of the important cogs in the complete service offered to industry by B-N. This experienced group works closely with production and metallurgy in designing for low cost manufacture and better end-use performance.

Burgess-Norton facilities and equipment are extremely diversified for the economical production of a wide range of precision parts, and include complete engineering, development, and metallurgy departments. This engineering service is available to you without obligation. If you have a parts production problem, we believe it will pay you to check into Burgess-Norton facilities. Send prints, specifications, or samples . . . or, if you prefer, one of our sales engineers will call, at your convenience.

BURGESS-NORTON MFG. CO.

GENEVA, ILLINOIS

Serving Industry For Over 50 Years

HARDENED AND GROUND SCREW MACHINE PRODUCTS

Pins, Bushings, Shafts

STAMPED AND MACHINED ASSEMBLIES, BRAZED, WELDED, HEAT TREATED

Tanks, Hydraulic and Other Components

directly from one phase of production to the next without stopping. The scale may be used on any crane and is available in capacities up to 200,000 pounds. Harnischfeger Corp.

FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

Cutting Pliers

. . . fit in workman's pocket

Cam action, high leverage cutting pliers, which, though only 9 inches long, cut up to ¼-inch hardened steel drill rod, is announced

by Utica. Pow'r Pli'rs are said to handle jobs for which a 24-inch bolt-cutter or a hack saw would be used. Jaws of the pliers are forged, extra hardened and hand honed. Handles are pressed steel. Utica Drop Forge & Tool Corp.

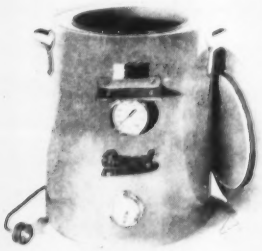
FOR MORE DATA CIRCLE NO. 10 ON REPLY CARD

Bench Wax Tank

. . . for small size dipping

Designed for small size dipping operations and low in cost, the ST-3 bench tank should effect real economy in handling. It can be plugged into any standard electrical outlet.

Portable and fast heating, the unit works under thermostatic control. Low current consumption



makes it ideal for small parts wax dipping and permits it to double as a glue pot when necessary. Aeroil Products Co. Inc.

FOR MORE DATA CIRCLE NO. 11 ON REPLY CARD

Electrochemical Process

. . . for finishing Lurium

A German-developed electrochemical process, which produces a permanently-brilliant surface finish on metal parts made of Lurium, is now being licensed by Fromson. Lurium is a high-purity aluminum introduced into the United States by this company.

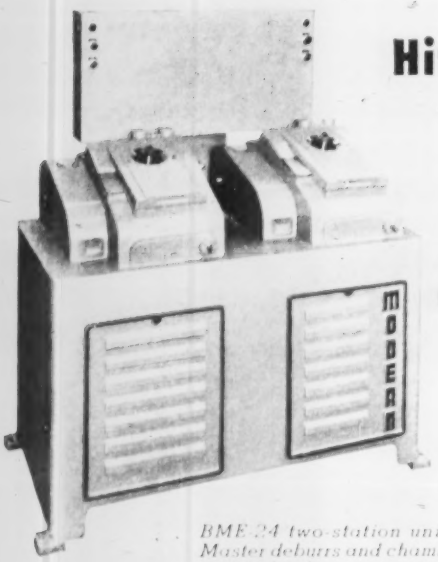
The Lubrite process uses common and relatively inexpensive chemicals. While current density during the brightening process is high, time required is only 30 to 60 seconds. Cost of ingredients is low. Fromson Orban Co. Inc.

FOR MORE DATA CIRCLE NO. 12 ON REPLY CARD

Labeling Tape

. . . adheres to oily surfaces

A pressure-sensitive labeling tape will adhere to oily as well as to dry metal surfaces. Oil-Stik combines with oil to produce a



Hit a new high in GEAR DEBURRING EFFICIENCY on a TWO-STATION UNIVERSAL *Burr-Master*

BME-24 two-station universal Burr-Master deburrs and chamfers both spur and helical gears as well as straight and involute form external splines.

Maximum operator utilization is yours with the BME-24 two-station universal Burr-Master for high production gear deburring and chamfering of spur and helical gears as well as straight and involute form splines.

Both stations can be tooled identically to handle the same gear, they can perform two different operations on the same part, or operate completely independently, turning out large volumes of two entirely different gears. Only one operator is required with any of these setups. At each station you can chamfer the entire tooth form and root at the rate of 5 teeth per second.

High volume isn't all you get with the Burr-Master. Quick and simple changeover and long life form tools lick the problem of down time and the need for skilled operators.

Complete details in Bulletin 103-60. Ask for it.

MODERN
14230 BIRWOOD AVE. DETROIT 38, MICHIGAN
Industrial Engineering Co.

See the Burr-Masters in action in Booth 1617 at the ASTE INDUSTRIAL EXPOSITION in Philadelphia, April 26-30

firm bond, yet permits the tape to be stripped off any time without leaving a mark.

Developed for identifying, warning and for every other labeling

use, the tape has writing surface suitable for pencil, ink or crayon. It can be preprinted. Tape is available in widths from ½ to 22 inches in 60-yard rolls on standard 3-inch cores. Labelon Tape Co. Inc.

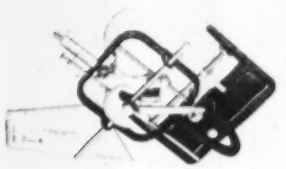
FOR MORE DATA CIRCLE NO. 11 ON REPLY CARD

Drawing Machine

. . . for accurate drawings

A drawing machine introduced by Bruning enables technical illustrators and draftsmen to make accurate pictorial drawings in less time.

Two simple settings, one to establish the major diameter, one the minor diameter, enable the user to draw mathematically precise ellipses in any ratio by degrees or



from points on a drawing. Repeated and related ellipses on the same axis are achieved through the instrument's rolling parallel action. Charles Bruning Co. Inc.

FOR MORE DATA CIRCLE NO. 14 ON REPLY CARD

Nylon Inserts For Nuts

. . . extend usability

As an insert material, nylon has been preferred for many applications because it is unaffected by such liquids as gasoline, kerosene, alcohol, motor oil, grease, soaps and caustics. It retains good torque characteristics in sub-zero temperatures.

Extended locknut re-usability which nylon makes possible is particularly important in case of anchor and gang channel nuts. Ny-

lon inserts are now standard on these lines. Elastic Stop Nut Corp.

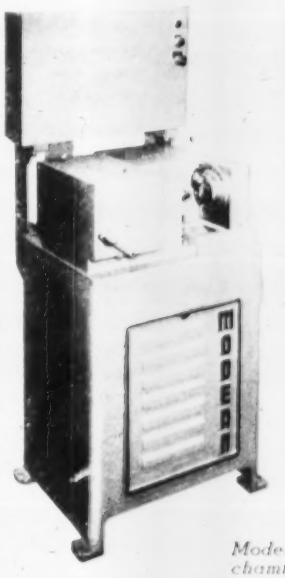
FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

Cleaning Solution

. . . destroys useless chromium

A product called Chromekill 1A is designed for destruction of hexavalent chromium in alkaline cleaning and plating solutions. It was designed to give a dual action: Fast reduction of hexavalent chromium to the harmless trivalent chromium state; more stable reducing agents to give prolonged protection.

The material is available as a fine free-flowing powdered mixture



High Production Universal Burr-Master for deburring and chamfering Internal Gears

Model BMI-14 Burr-Master deburrs and chamfers internal splines and helical or spur gears from ⅜" to 3½" pitch diameter.

Only Burr-Master's patented action chamfers both sides of the tooth and root of internal splines, straight sided or involute form helical or spur internal gears.

Only Burr-Master gives you a high production rate of 5 teeth per second, long-life circular form tools, rapid change-over and the versatility needed to handle all internal gears within its work range.

Only Burr-Master combines all these features with operating simplicity that permits even an inexperienced operator to maintain a high production rate.

Only Modern builds the Burr-Master.

Complete details in Bulletin 103-81. Ask for it.

14230 BIRWOOD AVE. MODERN DETROIT 38, MICHIGAN
Industrial Engineering Co.

See the Burr-Masters in action in Booth 1617 at the ASTE INDUSTRIAL EXPOSITION in Philadelphia, April 26-30

and is used in concentrations of the order of ¼ ounce per gallon. A test solution for determining the presence of hexavalent chromium in alkali cleaners as well as plating solutions is also available. Enthone Inc.

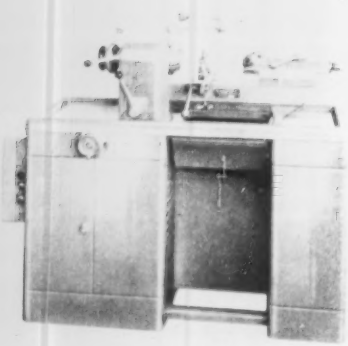
FOR MORE DATA CIRCLE NO. 16 ON REPLY CARD

Hand Screw Machine

. . . gives instant reversals

Model No. 73 hand screw machine includes a feature said to give instant reversals without disturbing continuous forward operations of the motor.

A hardened and ground self-centering bed has two symmetrically beveled sides, assuring balanced



precision alignment of all attachments. The drive, enclosed in the pedestal cabinet, gives an infinitely variable speed with a top spindle speed of 3500 rpm. Powered by a 1-hp motor, high-low speeds in a ratio of 5-to-1 are obtained through a clutch. The brake is provided for quickly stopping headstock spindle. Wade Tool Co.

FOR MORE DATA CIRCLE NO. 17 ON REPLY CARD

Metallizing Process

. . . increases pot life

A line of metallized pressed steel pots for heat treating makes possible 200 to 300 per cent longer life on some metal melting and heat treating operations.

Special impregnated metal coatings on the outside surface of the container protect it against heat oxidation and scaling at various temperature ranges up to 1850 F. Choice of three different coatings in all standard sizes and shapes permits pot life for a variety of jobs. Eclipse Fuel Engineering Co.

FOR MORE DATA CIRCLE NO. 18 ON REPLY CARD

FREE LITERATURE

Catalogs and Clip Sheets

Reply card on page 205 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Hydratork Drive

Clark Equipment Co. Design, operation and maintenance of the recently introduced, clutchless Hydratork Drive are covered in an 8-page, illustrated brochure. A description of operational details, illustrations including close-up photographs of cutaway working production units and photographs showing assembly and disassembly of the drive are included.

FOR MORE DATA CIRCLE NO. 19 ON REPLY CARD

Bonding Cement

Ceilcote Co. "Corobon, An Improved Bonding Cement for Brick and Tile" is the title of a 4-page illustrated catalog. Among its technical and general information on the product is a section describing the manner in which the bonding cement sets. A chemical resistance chart serves as a guide to chemical applications.

FOR MORE DATA CIRCLE NO. 20 ON REPLY CARD

Standards

American Standards Association Thousands of questions about the mechanical field in this country and foreign countries are answered by the ASA's library. A booklet offered by ASA, "The Library of Standards," tells what the library service is, what it contains and what it can do for you. It's a pocket-sized guide to 60,000 standards, specifications and related documents, and file of technical material.

FOR MORE DATA CIRCLE NO. 21 ON REPLY CARD

Grinder-Polisher

Hammond Machinery Builders Inc. The company offers a 4-page brochure covering their polishing lathe and abrasive belt backstand. Bulletin 635 is illustrated, with text covering advantages of machines and giving speeds and standard specifications of a few of them.

FOR MORE DATA CIRCLE NO. 22 ON REPLY CARD

Radiation Digest

General Electric Co. First issue of a new industrial publication known as "Radiation Digest," has been published by G. E. The digest presents original material in easy-to-read, digest form, plus abstracts of major current literature of interest to men in fields in which x-ray, electron beam and related radiation devices are employed.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

Metal Compacting Press

Baldwin-Lima-Hamilton Corp. Bulletin 3104 describes the model L 50-ton powdered metal compacting press, and lists its design specifications. A table of exclusive features explains how the press is designed for high-quality, low-cost production in the fabrication of parts from metal powders.

FOR MORE DATA CIRCLE NO. 24 ON REPLY CARD

Lubrication Film

Stewart-Warner Corp. Alemite Division offers the sound slide film "No Margin for Error." The film contains answers to lubrication problems that are headaches to cost conscious production men. The audience is taken into a typical industrial plant showing the right and wrong way to handle lubricants from barrel to bearing. A 12-page booklet offered with the movie is titled "Five Plans for Better Plant Lubrication."

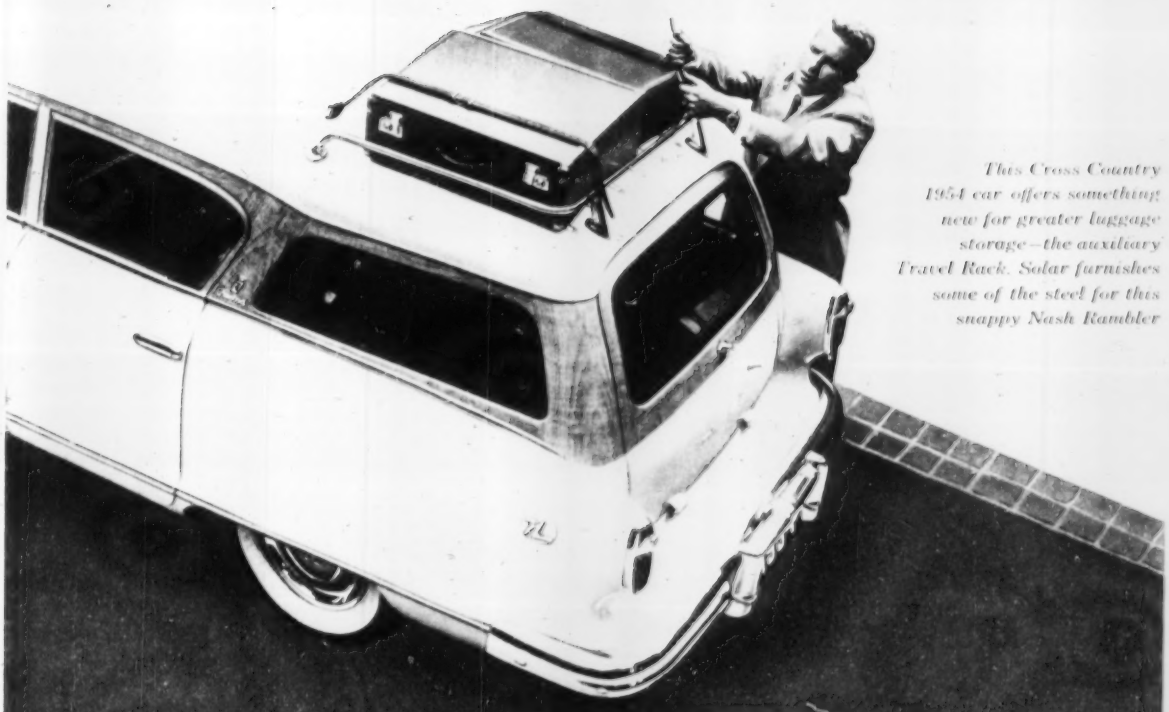
FOR MORE DATA CIRCLE NO. 25 ON REPLY CARD

Arc Welding Accessories

Metal & Thermit Corp. An illustrated, 20-page catalog of arc

SURE-SPEC STEELS

steel for any part
you make for any product
anytime at minimum cost!



This Cross Country 1954 car offers something new for greater luggage storage—the auxiliary Travel Rack. Solar furnishes some of the steel for this snappy Nash Rambler

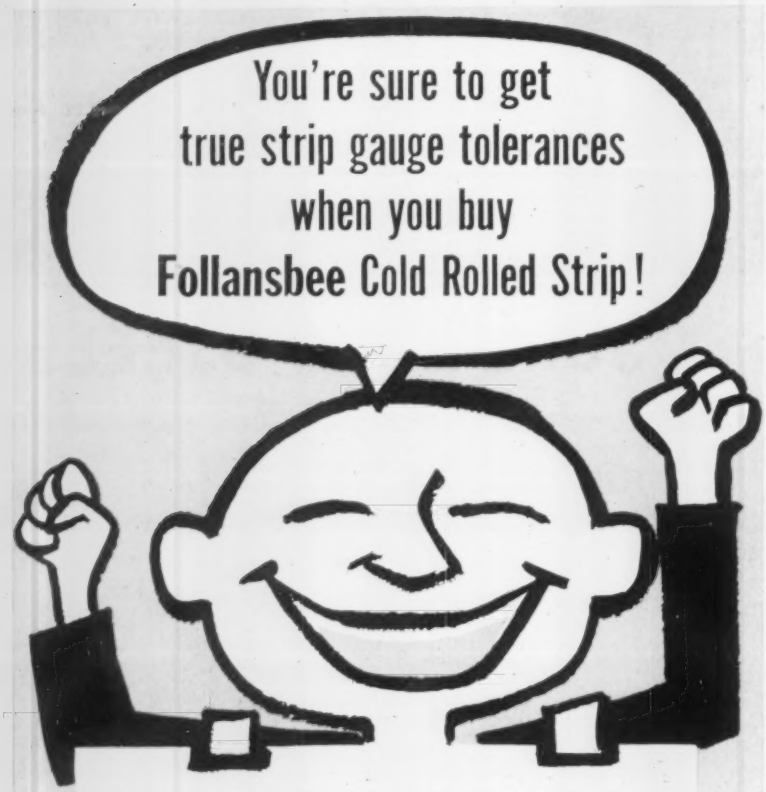
"for service dependable as the sun"

SOLAR STEEL CORPORATION

General Offices • Cleveland, Ohio

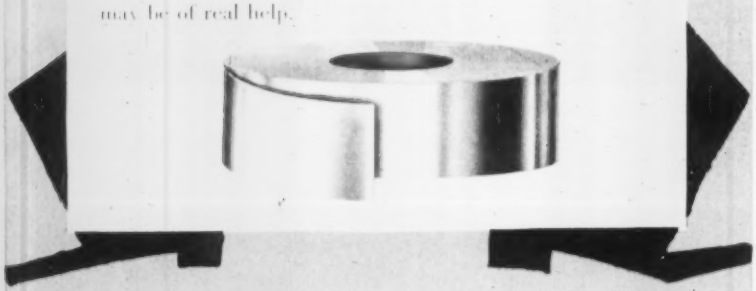
SALES OFFICES: Bridgeport • Chicago • Cincinnati • Cleveland • Detroit • Grand Rapids Kalamazoo • Los Angeles • Milwaukee • Montreal • Nashville • Philadelphia River Rouge • Rochester, N.Y. • Toledo • Union, N. J. • Washington, D.C. • Worcester, Mass.

FLAT ROLLED AND BAR AND TUBE STOCKS AND PROCESSING SERVICES FROM 11 PLANTS



When you specify Follansbee Cold Rolled Strip, you get more than just the width you require. You're sure of true strip gauge tolerances as well as the right temper and working qualities necessary in your press operations. These proper qualities keep production costs down all along the fabricating line. The fact that you can feed your presses directly from coils of Follansbee Cold Rolled Strip assures additional efficiency and economy.

Regardless of the type of stamping or forming operation, the uniformity of Follansbee Cold Rolled Strip is sure to offer many real advantages. Consult your Follansbee Steel representative about the quick, direct, personalized service you can get directly from the mill. His suggestions on strip steel specifications may be of real help.



FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

POLISHED BLUE SHEETS AND COILS SEAMLESS TERNE ROLL ROOFING
COLD ROLLED STRIP

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee, Chicago, Indianapolis, Kansas City, Nashville, Los Angeles, San Francisco, Seattle, Toronto and Montreal, Canada. *Plants*—Follansbee, West Virginia. Follansbee Metal Warehouses: Pittsburgh, Pa., Rochester, N. Y., Fairfield, Conn.

welding accessories is intended to provide a quick reference source. Included are electrode holders, helmets, eye shields, ground clamps, cleaning tools, gloves, welding cable and many other related products.

FOR MORE DATA CIRCLE NO. 26 ON REPLY CARD

V-Belt Drive Films

Allis-Chalmers Mfg. Co. Second group in a series of 35-mm sound slide films is available through the General Machinery Division. Titles are: "In Every V-Belt Drive," "For Better Driving" and "Selecting a Drive." The first covers engineering principles basic in every v-belt drive application; the second, installation and maintenance of multiple v-belt drives; the third, how to check characteristics to find the best type of drive.

FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

Tube Bending Press

Pines Engineering Co, Inc. An illustrated bulletin describing the mechanical features and operating advantages of a 20-ton hydraulic bending press is offered. Four pages describe the many new design features of the press, which has been especially built to handle pipe and tube sizes up to 2 inches OD by 0.083 wall.

FOR MORE DATA CIRCLE NO. 28 ON REPLY CARD

Motor Frame Chart

Reliance Electric & Engineering Co. To dispel confusion over new motor mounting dimensions, Reliance has produced the "Compar-A-Frame" chart to aid in quickly comparing old and new NEMA ac frame assignment standards. The single page chart shows at a glance comparative dimensions of open type and fan-cooled type polyphase induction motors. Subcharts compare frame sizes according to horsepower and speed.

FOR MORE DATA CIRCLE NO. 29 ON REPLY CARD

Electrical Modernization

Westinghouse Electric Corp. A 16-page booklet on electrical modernization in industrial plants is available from Westinghouse. "Compete or Collapse" is the title of the booklet, which points out that while modernization is the key to successful competition, the first step in any modernization

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program must be the efficient distribution of electrical power. Principal elements of a modern electrical system are described and illustrated.

FOR MORE DATA CIRCLE NO. 30 ON REPLY CARD

Production Turning

Monarch Machine Tool Co.—A major tool development designed specifically to simplify, speed and economize on a broad range of toolroom and production-turning operations is the subject of a booklet issued by Monarch. Photographs supplement 20-page text. Attachments and specs are listed.

FOR MORE DATA CIRCLE NO. 31 ON REPLY CARD

Drill Jig Bushings

Ex-Cell-O Corp.—A new drill jig bushing catalog reports bushings which were previously listed as specials are now standard and carried in stock. Drill size ranges have been increased and new lengths have been added to the four groups of renewable bushings and liners. A conversion chart has been added.

FOR MORE DATA CIRCLE NO. 32 ON REPLY CARD

Chuck Catalog

Taft-Peirce Mfg. Co.—"The Superpower Magnetic Chuck Catalog," No. 411, covers their entire line of electromagnetic chucks. Chuck sizes, specifications and prices are included, as well as general information concerning applications and advantages of magnetic chucking.

FOR MORE DATA CIRCLE NO. 33 ON REPLY CARD

Company Facilities

R. C. Mahon Co.—"A Picture Story of R. C. Mahon Co." is a 46-page report designed to portray their extensive metal fabricating and production facilities, its products and services and its capacity to serve industry. The activities, products and production methods of the eight divisions are treated separately.

FOR MORE DATA CIRCLE NO. 34 ON REPLY CARD

Low-Alloy Steel

Jones & Laughlin Steel Corp.—A 25-page catalog offers information on Jalten low-alloy, high-strength steel. The book is designed to show what Jalten is, what it does, where it is being used now, and how it can be used advantageously in your own applications.

FOR MORE DATA CIRCLE NO. 35 ON REPLY CARD

Nickel Plating

International Nickel Co. Inc.—Bulletin No. 77 is a 44-page general publication with over 40 illustrations, tables and charts designed to provide the designer, specifying engineer and user with basic information on electroplating and nickel plating. Mechanical properties are given and recommendations on preparation of basis metals made.

FOR MORE DATA CIRCLE NO. 36 ON REPLY CARD

Shaving Machines

National Broach & Machine Co.—A 16-page, two color illustrated catalog describes Red Ring horizontal shaving machines for large external gears. The catalog is illustrated and contains a complete specification and capacity table for four models.

FOR MORE DATA CIRCLE NO. 37 ON REPLY CARD

Silent Chain

Link-Belt Co.—An 88-page Silent Chain book, No. 2425, contains comprehensive engineering data. Book lists pre-engineered stock drives for normal requirements in a 16-page section. Another section

For free literature, editorial clips or more information on products described in this issue, circle the corresponding number at left—or fill in box below.

1	11	21	31	41	51	61	71	81	
2	12	22	32	42	52	62	72	82	
3	13	23	33	43	53	63	73	83	
4	14	24	34	44	54	64	74	84	
5	15	25	35	45	55	65	75	85	
6	16	26	36	46	56	66	76	86	
7	17	27	37	47	57	67	77	87	
8	18	28	38	48	58	68	78	88	
9	19	29	39	49	59	69	79	89	
10	20	30	40	50	60	70	80	90	

4-19-54

FIRST CLASS
Permit No. 36
Sec. 34.9 P.L.&R.
CLEVELAND, OHIO

BUSINESS REPLY CARD

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

STEEL

Penton Building

Cleveland 13, Ohio

outlines procedure for selecting completely-engineered drives. It includes a conveniently-indexed table of service factors, rating tables and chain length and center distance computations. Sections on drive components and accessories, and complete operational and technical data are also included.

Threading Machines

Landis Machine Co. A new bulletin covers the 32C and 36C Landmaster threading machines designed for heavy-duty threading of large diameter workpieces. Nine pages cover design features, motor drives, coolant systems and specifications. A schematic drawing identifies working parts.

Plastic Pipe

Republic Steel Corp. Republic offers a 12-page booklet on their plastic pipe, both semirigid type H and flexible type E. Product features and applications are covered, with size and weight table and estimated safe working pressures chart included.

Type 4300 Steels

International Nickel Co. Inc. Bulletin NS-1, 6 pages, includes 46 charts which present a digest of information on composition, heat treatment, transformation characteristics and mechanical properties of the standard AISI and SAE nickel - chromium - molybdenum steels.

Furnace Arches

LaClede Christy Co. A 19-page booklet, "LaClede Arches in Metallurgical Furnaces," covers materials of construction, nose construction heating furnaces, rotary hearth forge furnaces, etc.

Next Week in STEEL

CHIP BREAKER design exerts a strong influence on the efficiency of any single-point machining operation. In the April 26th issue of STEEL, the editors will present a special article on determining the right chip breaker for the job.

EDITORIAL REPRINTS:

Tool and Die Forum

Cost-conscious buyers are imposing new tool and die requirements. Chemical and physical properties once considered magnificent, are being stressed. Notable gains are being made in high-alloy, higher-physical-property steels. Economy picture is rounded out by new plastics for tools, dies, jigs, fixtures, gages, patterns and locating blocks. This is the consensus of 21 suppliers of tool and die materials who contributed comments in STEEL's special Tool and Die Materials Forum.

Financial Analysis

The year 1953 was No. 1 for sales and No. 2 for earnings. This is the summary made in STEEL's new Financial Analysis of the Steel Industry. The annual report is compiled from data from 31 producers, representing 93.4 per cent of the steelmaking capacity in the United States.

Galvanizing

"New Angles for the Galvanizing Line," a two-part article concluded April 12, describes the continuous strip galvanizing line installed at Wheeling Steel Corp.'s Martins Ferry plant by Wean Engineering Co. Inc. The second article in the series deals with the elaborate drives and controls set-up included in the line.

Automation

Third of STEEL's Program for Management Series, "Automation . . . How Far Should You Go," emphasizes the fact that virtually any production or procedures function can be automated, if it can be justified economically. Robert E. Huber, Machine Tool Editor, says the question then is not "should you?" but rather "to what degree?"

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5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

4-19-54

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STEEL

April 19, 1954

Market Outlook

A NEW LOW for the year was set by steel ingot production in the week ended yesterday. The rate was 67 per cent of capacity. This marked the second consecutive week of a decline of a point from the preceding week.

April thus far is the weakest steel production month this year. All of the weeks of the first two months of the year were characterized by steel ingot production rates in the 70s, and the first week of March was a strong 70 per cent. All of April's production has been below 70 per cent.

SITTING IT OUT—Ordinarily, in a civilian economy the steel business picks up in the spring. This year it has been dropping off. The seasonal factor has been thwarted by heavy inventories carrying over from the war economy that existed into last year. When the inventories are used up, the seasonal buying patterns can emerge again. "Meanwhile, we'll have to sit this one out," one steel salesman says.

CONTRASTS— Evidence that steel consumers are still living off inventories can be found in the automobile industry, largest steel user in the country. The U. S. automobile industry is using steel at a rate of only 15 per cent below that of a year ago, but the steel industry's ingot production is down 31 per cent.

Because steel consumption did decline about the time the inventory reduction was started, the time needed to complete the inventory reduction has been prolonged.

STRAWS IN THE WIND—Some people think that steel production will rise during the summer when completion of inventory reductions sends buyers back into the market for steel. Heralding such a trend may be the buying plans reported in a STEEL survey. Those reporting in the survey say they expect to buy 3.7 per cent more steel tonnage in May than they bought in March. Of those reporting on May plans compared with March performance, 46 per cent expect to make no change, 20 per cent expect to buy less, and 34 per cent expect to buy more steel.

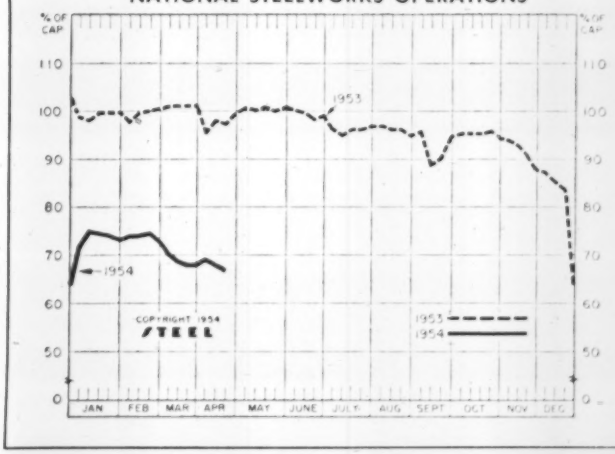
STRONG POINTS—Products in strongest demand today are tubular goods. In some areas, sales of light and medium tubular products have improved steadily during the last month, and sales now are not far below volume during the comparable period of last year. One producer reports April order books for seamless tubing are filled, and an early filling for May is in prospect. In that same area, buttweld pipe is available in two to four weeks. Pittsburgh Steel Co. says its backlog of tubular goods is large and may keep its tube mills running at capacity the rest of this year.

Demand for galvanized sheets is strong, too. Producing this strength are a good rate of building construction and the government grain bin program.

Other forms of finished steel showing seasonal upturns are merchant wire, structural shapes and tin plate.

PRICES STEADY—Price indexes remain unchanged, although there are scattered and minor downward revisions in response to competition. STEEL's price composite on finished steel continues at $113.70 a net ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Apr. 18	Change	Same Week 1953	Same Week 1952
Pittsburgh	69	2	98.5	102
Chicago	74.5	6*	105	94
Mid-Atlantic	59	3	96.5	93
Youngstown	68	1	95	95
Wheeling	73	1.5	100.5	101.5
Cleveland	68.5	+ 1.5*	100.5	97
Buffalo	67.5	0	106.5	104
Birmingham	46	31	101	102
New England	60	+ 9	87	85
Cincinnati	66.5	12.5	94	94
St. Louis	62.5	0	75.5	90
Detroit	59	7	106	107
Western	80	+ 3	110.5	89.5
National Rate	67	1	97	96.5

INGOT PRODUCTION‡

	Week Ended Apr. 18	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	99.9†	101	100.4	138.7
NET TONS (In Thousands)	1,601†	1,622	1,613	2,228

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

The Metalworking Outlook—p. 85 Technical Outlook—p. 135

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Apr. 13

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400
Rails, light, 40 lb	5.767
Tie Plates	5.125
Axles, railway	7.250
Wheels, freight car, 33 in. (per wheel)	47.000
Plates, carbon	4.550
Structural Shapes	4.367
Bars, tool steel, carbon (lb)	0.415
Bars, tool steel, alloy, oil hardening die (lb)	0.505
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.80 (lb)	1.075
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.550
Bars, H.R., alloy	$8.575
Bars, H.R., stainless, 303 (lb)	0.418
Bars, H.R., carbon	4.873
Bars, reinforcing	4.900
Bars, C.F., carbon	7.960
Bars, C.F., alloy	11.000
Bars, C.F., stainless, 302 (lb)	0.433
Sheets, H.R., carbon	4.765
Sheets, C.R., carbon	5.704
Sheets, galvanized	6.945
Sheets, C.R., stainless, 302 (lb)	0.548
Sheets, electrical	9.000
Strip, C.R., carbon	7.243
Strip, C.R., stainless, 430 (lb)	$0.415
Strip, H.R., carbon	4.975
Pipe, black, buttweld (100 ft)	14.454
Pipe, galv., buttweld (100 ft)	17.731
Pipe, line (100 ft)	141.960
Casing, oil well, carbon (100 ft)	149.516
Casing, oil well, alloy (100 ft)	214.113
Tubes, boiler (100 ft)	‡
Tubing, mechanical, carbon (100 ft)	‡
Tubing, mechanical, stainless, 304 (100 ft)	161.193
Tin plate, hot-dipped, 1.25 lb	$8.433
Tin plate, electrolytic, 0.25 lb	7.133
Black plate, can making quality	6.233
Wire, drawn, carbon	7.713
Wire, drawn, stainless, 430 (lb)	0.545
Bale ties (bundle)	5.663
Nails, wire, 8d common	7.488
Wire, barbed (80-rod spool)	6.847
Woven wire fence (20-rod roll)	16.174

‡ Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Apr. 13 1954	Apr. 6 1954	Month Ago	Mar. Average
(1947-1949=100)	140.9	140.9	140.9	140.9

STEEL's FINISHED STEEL PRICE INDEX*

	Apr. 15 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av. = 100)	189.74	189.74	189.74	181.31	154.01
Index in cents per lb	5.140	5.140	5.140	4.912	4.172

STEEL's ARITHMETICAL PRICE COMPOSITES

	Apr. 15 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT*	$113.70	$113.70	$113.70	$110.98	$94.45
No. 2 Fdry. Pig Iron, GT.	56.54	56.54	56.54	55.04	46.63
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.22
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	47.34
Steelmaking Scrap, GT	25.33	25.33	24.33	43.75	24.08

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Apr. 15 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.35
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	4.405	4.405	5.302	4.502	3.816
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.25
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, del., Philadelphia	4.38	4.38	4.38	4.13	3.492
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.10	4.10	4.10	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.10	4.10	4.10	4.35	3.65
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.25
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.975-4.225	3.50
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.30
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.10-5.80	4.375
Strip, C.R., Chicago	5.20	5.20	5.20	5.35	4.25
Strip, C.R., Detroit	5.65	5.65	5.65	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.225-5.475	4.15
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.35	5.20
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$7.75
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ⅜-⅝" Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	Apr. 15 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.25	49.39
No. 2 Fdry., Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry., Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry., Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry., del. Phila.	60.16	60.16	60.16	59.75	49.89
No. 2 Fdry., Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.43
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00	228.00*	163.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$26.50	$26.50	$25.50	$44.00	$25.00
No. 1 Heavy Melt, E. Pa.	22.00	22.00	22.00	43.50	23.25
No. 1 Heavy Melt, Chicago	27.50	27.50	25.50	42.75	24.00
No. 1 Heavy Melt, Valley	25.50	24.50	23.50	42.75	23.00
No. 1 Heavy Melt, Cleve.	22.50	21.50	20.50	42.75	21.00
No. 1 Heavy Melt, Buffalo	23.50	23.50	24.00	45.50	24.75
Rails, Rerolling, Chicago	34.50	34.50	36.50	52.00	32.50
No. 1 Cast, Chicago	38.50	36.00	33.00	42.00	29.50
COKE, Net Ton					
Beehive, Furn., Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry., Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas. In bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb del.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg, $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 del. Conn. Valley, 30.125 del. Midwest; Lake 30.00 del.; Fire refined 29.75 del.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 13.80, chemical 13.90, corroding 13.90, St. Louis; New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, selfpalletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more, f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $220-$222 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or

DAILY NONFERROUS PRICE RECORD

	Price Apr. 15	Last Change	Previous Price	Mar. Avg.	Feb. Avg.	Apr. 1953 Avg.
Copper	30.00	Apr. 12	29.75-30.00	29.865	29.750	30.735
Lead	13.80	Apr. 12	13.55	12.735	12.610	12.473
Zinc	10.25	Mar. 29	9.75	9.657	9.369	11.000
Tin	97.25	Apr. 15	97.50	92.518	85.181	102.567
Nickel	60.00	Jan. 14, 1953	56.50	60.000	60.000	60.000
Aluminum	21.50	July 15, 1953	20.50	21.500	21.500	20.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+%, del.; Magnesium 99.8%, Freeport, Tex.

ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.02.

Osmium: $140-$150 per troy oz nom.

Palladium: $21 per troy oz.

Platinum: $84-$87 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $70-$75 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, spot, 97.25; prompt, 97.25.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.) $4.72; grade A-2 (0.5% Fe max.) $4.46 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.65 per lb f.o.b. shipping point; less than 1000 lb $4.80; 99+% hydrogen reduced $4.95. Treated ingots $6.70.

Zinc: Prime Western 10.25, brass special 10.50, intermediate 10.75, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.60, special high grade 11.75, die casting alloy ingot 14.25, del.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 21.00-22.50; No. 12 foundry alloy (No. 2 grade) 20.00-21.00; 5% silicon alloy, 0.60 Cu max., 22.50-23.50; 13 alloy, 0.60 Cu max., 22.50-23.50; 195 alloy 21.75-22.75; 108 alloy 20.50-21.50.

Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.00-22.00; grade 2, 20.00-21.00; grade 3, 18.50-19.50; grade 4, 18.00-19.00.

Brass Ingot: Red brass, No. 115, 26.00; tin bronze No. 225, 38.50; No. 215, 32.25; high leaded tin bronze, No. 305, 31.00; No. 1 yellow, No. 405, 22.25; manganese bronze No. 421, 26.75.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 27.00; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; 4 c.l. 35.98. **Weatherproof,** 100,000 lb, 36.28; 30,000 lb, 36.53; l.c. 37.03. **Magnet wire del.,** 15,000 lb or more 41.83; l.c.l., 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) **Sheets,** full rolls, 140 sq ft or more $19.00 per cwt; pipe, full coils $19.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 100,000 lb and over, f.o.b. mill.) **Sheets,** $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	80.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	68.5	90.5
Rod, Shapes	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks	....	60.0	....

ALUMINUM

(30,000 lb base, freight allowed over 499 lb) **Sheets and Circles:** 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In. Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	12-48	33.9	....	....
0.135-0.096	12-48	34.4	....	....
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

AUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 90 in. width or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
24-F 38-F	32.4	36.3
52S-F	33.5	37.4
61S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

AUMINUM

Screw Machine Stock: 5000 lb and over.

Nom. or Across flats	Round— 118-T3	178-T4	Hexagonal— 118-T3	178-T4
Drawn				
0.125	50.6	57.9	....	....
0.156-0.172	50.6	48.9	....	....
0.188	50.6	48.9	....	62.4
0.219-0.234	47.9	46.2	....	....
0.250-0.281	47.9	46.2	....	59.5
0.313	47.9	46.2	....	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	....	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	....	....
1.625-2.000	42.1	40.4	....	44.1
2.125-2.500	41.1	39.4	....	....
2.750-3.375	39.9	38.2	....	....

AUMINUM

Forging Stock: Round, Class 1, 43.8-34.4, in specific lengths 36-144 in. diameters 0.375-8 in.; rectangles and squares, Class 1, 50.2-38.4 in. random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¾	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 91.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 53.00, 20,000 lb or more, 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 1 in. 63.00, Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clippings 13.00; low copper clipping 13.00; mixed clippings 11.00-12.00; old sheet 10.00-11.00; borings and turnings 7.00; pistons and struts 7.00; crankcases 10.00-11.00; industrial castings 10.00-11.00.

Copper and Brass: Heavy copper and wire, No. 1 24.00; No. 2 copper 22.50; light copper 20.50; No. 1 composition red brass 17.50; No. 1 composition turnings 17.00; mixed brass turnings 12.50; new brass clippings 11.00; No. 1 brass rod turnings 13.50; light brass 15.00; heavy yellow brass 13.50; new brass rod ends 15.00; auto radiators, unsweated 13.50; cocks and faucets 15.00; brass pipe 16.25.

Lead: Heavy 10.50-11.00; battery plate 5.75-6.00 (hardcase and stereotype 12.75; electrotype 11.00; mixed babbitt 12.50.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 50.00-55.00; block tin pipe 70.00-75.00; No. 1 babbitt 40.00-45.00.

Zinc: Old zinc, 4.50; new die cast scrap, 4.00; old die cast scrap, 3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 15.00-15.50; 51S, 52S clippings 15.00-15.50; 14S, 17S, 24S clippings 14.00-14.50; mixed clippings 14.00-14.50; old sheet 12.50-13.00; old cast 12.50-13.00; clean old cable, free of steel 15.00-15.50; borings and turnings 12.50-13.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 26.25-26.50; No. 2 copper 24.75-25.00; light copper 23.25-23.50; refinery brass (60% copper) per dry copper content 21.50-22.50; auto radiators, 16.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 26.25-26.50; No. 2 copper 24.75-25.00; light copper 23.25-24.00; No. 1 composition borings 19.00-19.50; No. 1 composition solids 19.50-20.00; heavy yellow brass solids 15.25-15.50; yellow brass turnings 14.25-14.50; radiators 15.50-16.00.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.75 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.165; 200-499 lb $1.15; 500-999 lb $1.145; 1000 lb or more $1.14.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35, 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85, 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1 cent premium to above.

Sodium Stannate: Less than 100 lb 73.5; 100-500 lb 70.4; 500-1000 lb 56.6; 2000-9900 lb 54.8; 10,000 lb or more 53.7.

Stannous Chloride (Anhydrous): Less than 50 lb $1.60; 50 lb $1.25; 100-500 lb $1.11; 500-1000 lb $1.068; 500-1999 lb $1.061; 2000-4999 lb $1.02; 5000-19,000 lb 96.4; 20,000 lb and over 90.3.

Stannous Sulphate: Less than 50 lb $1.298; 50 lb 99.8; 100-1999 lb 97.8; 2000 lb and over 95.8.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38-b	45.98c	....	48.44	26.000	25.000	25.250
Yellow Brass	41.72	33.50d	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	e18.250	18.000	17.500
Commercial Bronze, 90%	48.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	50.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	64.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.56	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Nonferrous Metals

Metals buying by fabricators runs ahead of use. Resumption of inventory building stems from rising market. Buyers are proceeding cautiously

SMALL-SCALE replica of last year's boom-bust cycle in metals could be shaping up.

Fabricator's buying is running ahead of use. The sharply rising market contributes to this resumption of inventory buying, but to date purchasing agents have kept their perspective and proceeded cautiously.

What's Needed?—If fabricators do stampede the market and "mortgage their future," as one observer puts it, they could find themselves long on metal again. Then the market, propelled upwards by their overbuying, would start its downhill roll.

Prices abroad have fluctuated more violently than those at home. In sensitive international trading centers, a wave of "war scare" jitters last week touched off frenzied, near-panicky buying. It sent tin, copper, lead and zinc quotations soaring on the London Metal Exchange. The inevitable reaction wasn't far behind, but levels of all are generally higher than when they started.

At Home—In the U. S., lead, custom smelter copper, tin, mercury, brass and bronze ingot and copper-base scrap saw higher prices last week. Demand for all is relatively strong and incoming orders steady. April promises to be the best month for sales so far this year in nearly all nonferrous metals. Business prospects for fabricators are brightening in many areas, too.

Signs are more evident that the inventory unloading of the last nine months that depressed prices and sales volume is nearing an end. Fabricators, who once carried 90-120 day stocks, are said to be back to 30 days or less. Many are inclined to let producers carry their inventory, buying only for short periods ahead. While this policy keeps them in a more liquid position, it also contributes to price fluctuations in spot metal and prevents downward pressure on futures.

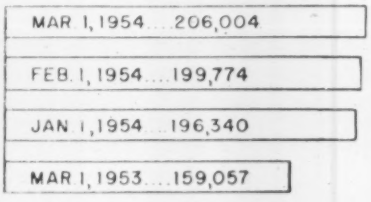
Good Month—After seven weeks of climbing, prices appear to be leveling off for the bulk of the metals group. Since early March, lead has moved up 1.5 cents, zinc 1 cent. Mercury showed the sharpest advance—$25 per 76-pound flask—for which government buying abroad is largely responsible.

Tin quotations are again changing almost hourly; last week they hit the price range ($1.00-$1.10) where stocks from an international buffer pool would have to be sold. Custom smelters have advanced their copper price to a flat 30 cents, equal to the charge of mine producers, and report they're already sold out through May. There's no consensus among market men about how strong their bubble is. But they know if there's trouble, the government stockpile is available for temporary repairs.

STILL CLIMBING

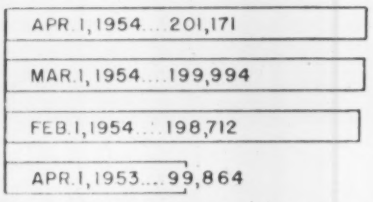
Lead Stocks*

(Net tons at smelters and refiners)



Zinc Stocks†

(Net tons at smelters)



Sources: *American Bureau of Metal Statistics
†American Zinc Institute

Prices Turn Upward

Most dramatic of the price increases last week was in tin. It jumped 4 cents on the strength of Far Eastern developments and broke the $1 mark for the first time in a year, but quickly subsided. Sale of 750 tons of tin to Argentina helped tighten the spot market.

Brass and bronze ingots tilted upwards from 0.5 to 2.25 cents on the strength of tin and copper scrap. Red brasses advanced 1 cent, tin bronzes 0.5 to 2.5 cents, yellow brasses 1 cent, and manganese bronzes 0.5 cent.

Lead marked its sixth successive quarter-cent increase since Mar. 9 and returned to its plateau of late summer at 14 cents. Scrap lead moved up fractionally but smelting charges on battery plates remained at $50-55.

On the Trail of Uranium

Now that the atomic bomb is passe, you'd think interest in uranium would be tapering. Not so, says the U. S. Geological Survey. Search for uranium is now one of the most intensive ever made for any metals in U. S. history, V. E. McKelvey told petroleum geologists in St. Louis. About 500 geologists are now employed by government and industry in this work, concentrated in western states. There are more geologists in uranium study than in all other minerals combined except oil, he reported.

Below Par

Fourteen critical materials still fall far short of stockpile goals, ODM Director Arthur S. Flemming told a Senate subcommittee last week. Of the 75 materials in the government stockpile program, 38 are in good shape, 12 near the goal and 11 in fair shape, he reported. Through fiscal 1953, obligations for stockpiling topped $4.7 billion, with expenditures in excess of $3.5 billion.

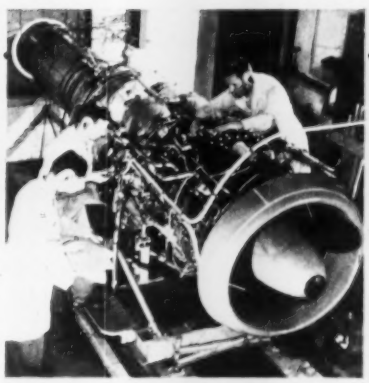
Market Memos

- World stocks of refined copper at the end of March topped 400,000 tons for the first time since before World War II, and domestic stocks of 125,759 were highest since 1949. Deliveries to consumers edged up to 95,759 tons but production followed suit as 117,546 tons of refined were turned out.
- Heavy demand for copper and copper alloy scrap from Japan and Europe plus higher bids from ingot makers and custom smelters here keep prices bumping at the ceiling of virgin copper.
- Brass and wire mills expect April to be their top month to date this year, though under year-ago levels.
- Aluminum springs are now being used on windows made of light metal. They have retained their resiliency in three years of use.
- Forty per cent longer nonwelded brass coils with weight per inch to width increased from 70 to 100 pounds are being rolled from new continuous-cast flat bars at Scovill Mfg. Co. Weight and size of standard bar was raised from 2200 to 3100 pounds. These coils already represent one-third of the company's total shipment of coiled brass.

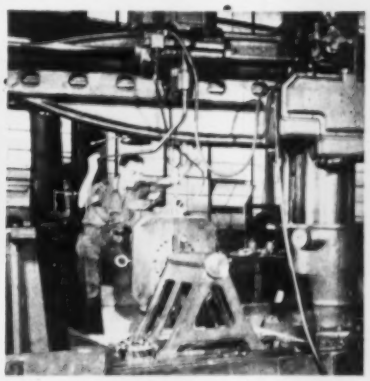
MAKE IT ALLOY

Versatile, dependable Chromium Steels are doing more different jobs today than ever before.

Constructional Alloy Steels—For greater strength and hardness in crankshafts, springs, transmission gears, countershaft pins, sway eliminator bars, through-hardened bearings and other critical parts, much of the alloy steel used by makers of automotive and farm equipment now contains chromium.



Stainless Steels—Every well-known type of stainless—both straight chromium grades and chromium-nickel grades—owes its resistance to heat and corrosion primarily to chromium.



Tool Steels—Whether for cutting, hot and cold forming, or die casting, whether the end product is a hand chisel or a forging die, nearly every present-day type of tool steel gets much of its strength and hardness from chromium.

The finest alloy steels are made with Vancoram ferro alloys.

VANADIUM CORPORATION OF AMERICA

420 Lexington Avenue, New York 17, N. Y.

DETROIT • CHICAGO • PITTSBURGH • CLEVELAND

Make it better...make it alloy

VANCORAM

Producers of alloys, metals and chemicals

STEEL PRICES

Mill prices as reported to STEEL, gents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company. Key on page 213. Key to footnotes, page 215.

SEMIFINISHED

INGOTS, Carbon Forging (NT)

Fontana,Calif. K1	$86.00
Munhall,Pa. U5	59.00

INGOTS, Alloy (NT)

Detroit R2	$63.00
Fontana,Calif. K1	88.00
Midland,Pa. C18	62.00
Munhall,Pa. U5	62.00

BILLETS, BLOOMS & SLABS Carbon Rerolling (NT)

Aliquippa,Pa. J5	$62.00
Bessemer,Pa. U5	62.00
Clairton,Pa. U5	62.00
Ensley,Ala. T2	62.00
Fairfield,Ala. T2	62.00
Fontana,Calif. K1	70.00
Gary,Ind. U5	62.00
Johnstown,Pa. B2	62.00
Lackawanna,N.Y. B2	62.00
Munhall,Pa. U5	62.00
So.Chicago,Ill. U5	62.00
So.Duquesne,Pa. U5	62.00

Carbon, Forging (NT)

Aliquippa,Pa. J5	$75.00
Bessemer,Pa. U5	75.00
Buffalo,R2	75.00
Clairton,Pa. U5	75.00
Cleveland,R2	75.00
Conshohocken,Pa. A3	75.00
Detroit,R7	75.00
Ensley,Ala. T2	75.00
Fairfield,Ala. T2	75.00
Fontana,Calif. K1	83.00
Gary,Ind. U5	75.00
Geneva,Utah C11	75.00
Houston,S5	83.00
Johnstown,Pa. B2	75.00
Lackawanna,N.Y. B2	75.00
LosAngeles B3	85.00
Munhall,Pa. U5	75.00
Seattle B3	86.00
So.Chicago,R2,U5,W14	75.00
So.Duquesne,Pa. U5	75.00
So.SanFrancisco B3	86.00

Alloy, Forging (NT)

Bethlehem,Pa. B2	$82.00
Buffalo R2	82.00
Canton,O. R2, T7	82.00
Conshohocken,Pa. A3	86.00
Detroit R7	84.00
Fontana,Calif. K1	101.00
Gary,Ind. U5	82.00
Houston,S5	90.00
Ind.Harbor,Ind. Y1	82.00
Johnstown,Pa. B2	82.00
Lackawanna,N.Y. B2	82.00
LosAngeles B3	102.00
Massillon,O. R2	82.00
Midland,Pa. C18	82.00
Munhall,Pa. U5	82.00
So.Chicago R2,U5,W14	82.00
So.Duquesne,Pa. U5	82.00
Struthers,O. Y1	82.00
Warren,O. C17	82.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2	$92.50
Canton,O. R2	92.50
Cleveland R2	92.50
Fontana,Calif. K1	113.50
Gary,Ind. U5	92.50
Massillon,O. R2	92.50
So.Chicago,Ill. R2	92.50
So.Duquesne,Pa. U5	92.50

SHEET BAR (NT)

Fontana,Calif. K1	$93.18

SKELP

Aliquippa,Pa. J5	3.85
Munhall,Pa. U5	3.75
Warren,O. R2	3.75
Youngstown,R2, U5	3.75

WIRE RODS

Alabama City,Ala. R2	4.525
Aliquippa,Pa. J5	4.525
Alton,Ill. L1	4.70
Buffalo W12	4.525
Cleveland A7	4.525
Donora,Pa. A7	4.525
Fairfield,Ala. T2	4.525
Fontana,Calif. K1	5.325
Houston,S5	4.925
Johnstown,Pa. B2	4.525
Joliet,Ill. A7	4.525
Kansas City,Mo. S5	4.965
Kokomo,Ind. C16	4.625
LosAngeles B3	5.325
Minnequa,Colo. C10	4.775
Monessen,Pa. P7	4.525
So.Tonawanda,N.Y. B11	4.525
Pittsburg,Calif. C11	4.475
Portsmouth,P12	4.525
Roebling,N.J. R5	4.625
So.Chicago,Ill. R2	4.525
Sparrows Point,Md. B2	4.625
Sterling,Ill. C11, N15	4.525
Struthers,O. Y1	4.525
Torrance,Calif. C11	5.325
Worcester,Mass. A7	4.525

STRUCTURALS

Carbon Steel Stand. Shapes

Alabama City,Ala. R2	4.10
Aliquippa,Pa. J5	4.10
Bessemer,Ala. T2	4.10
Bethlehem,Pa. B2	4.15
Clairton,Pa. U5	4.10
Fairfield,Ala. T2	4.10
Fontana,Calif. K1	5.75
Gary,Ind. U5	4.10
Geneva,Utah C11	4.10
Houston,S5	5.50
Ind.Harbor,Ind. I-2	4.10
Johnstown,Pa. B2	4.15
Kansas City,Mo. S5	4.70
Lackawanna,N.Y. B2	4.15
LosAngeles B3	4.80
Minnequa,Colo. C10	4.55
Munhall,Pa. U5	4.10
Niles,Calif. P1	4.80
Phoenixville,Pa. P4	4.15
Seattle B3	4.85
So.Chicago,Ill. U5, W14	4.10
So.SanFrancisco B3	4.75
Torrance,Calif. C11	4.80
Weirton,W.Va. W6	4.10

Wide Flange

Bethlehem,Pa. B2	4.15
Clairton,Pa. U5	4.10
Fontana,Calif. K1	5.10
Lackawanna,N.Y. B2	4.15
Munhall,Pa. U5	4.10
Phoenixville,Pa. P4	4.95
So.Chicago,Ill. U5	4.10

Alloy Stand. Shapes

Clairton,Pa. U5	5.00
Fontana,Calif. K1	6.40
Gary,Ind. U5	5.00
Munhall,Pa. U5	5.00
So. Chicago,Ill. U5	5.00

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5	6.175
Bessemer,Ala. T2	6.175
Bethlehem,Pa. B2	6.20
Clairton,Pa. U5	6.175
Fairfield,Ala. T2	6.175
Fontana,Calif. K1	6.825
Gary,Ind. U5	6.175
Geneva,Utah C11	6.175
Ind.Harbor,Ind. I-2	6.175
Ind.Harbor,Ind. Y1	6.675
Johnstown,Pa. B2	6.20
Lackawanna,N.Y. B2	6.20
LosAngeles B3	6.85
Munhall,Pa. U5	6.175
Seattle B3	6.90
So.Chicago,Ill. U5,W14	6.175
So.SanFrancisco B3	6.80
Struthers,O. Y1	6.675

H.S., L.A. Wide Flange

Bethlehem,Pa. B2	6.20
Lackawanna,N.Y. B2	6.20
Munhall,Pa. U5	6.125
So.Chicago,Ill. U5	6.125

PILING

Bearing Piles

Munhall,Pa. U5	4.10
So.Chicago,Ill. U5	4.10

STEEL SHEET PILING

Ind.Harbor,Ind. I-2	4.925
Lackawanna,N.Y. B2	4.925
Munhall,Pa. U5	4.925
So.Chicago,Ill. U5	4.925

PLATES

PLATES, Carbon Steel

Alabama City,Ala. R2	4.10
Aliquippa,Pa. J5	4.10
Ashland,Ky. (15) A10	4.10
Bessemer,Ala. T2	4.10
Clairton,Pa. U5	4.10
Claymont,Del. C22	4.10
Cleveland,Is. R2	4.10
Coatesville,Pa. L7	4.10
Conshohocken,Pa. A3	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Fontana,Calif. (30) K1	4.75
Gary,Ind. U5	4.10
Geneva,Utah C11	4.10
Granite City,Ill. G4	4.30
Harrisburg,Pa. C5	4.10
Houston,S5	4.50
Ind.Harbor,Ind. I-2, Y1	4.10
Johnstown,Pa. B2	4.10
Lackawanna,N.Y. B2	4.10
Lone Star,Tex. L6	4.10
Minnequa,Colo. C10	4.95
Munhall,Pa. U5	4.10
Pittsburgh J5	4.10
Riverdale,Ill. A1	4.10
Seattle B3	5.00
Sharon,Pa. S3	4.10
So.Chicago,Ill. U5, W14	4.10
Sparrows Point,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown,R2, U5, Y1	4.10

PLATES, Carbon Abras. Resist

Fontana,Calif. K1	5.90
Geneva,Utah C11	5.25

PLATES, Wrought Iron

Economy,Pa. B14	9.30

PLATES, High Strength Low-Alloy

Aliquippa,Pa. J5	6.25
Bessemer,Ala. T2	6.25
Clairton,Pa. U5	6.25
Cleveland,Is. R2	6.25
Conshohocken,Pa. A3	6.25
Ecorse,Mich. G5	6.45
Fairfield,Ala. T2	6.25
Fontana,Calif. (30) K1	6.90
Gary,Ind. U5	6.25
Geneva,Utah C11	6.25
Ind.Harbor,Ind. I-2	6.25
Ind.Harbor,Ind. Y1	6.25
Johnstown,Pa. B2	6.25
Lackawanna,N.Y. B2	6.25
Munhall,Pa. U5	6.25
Pittsburgh J5	6.25
Seattle B3	7.15
Sharon,Pa. S3	6.25
So.Chicago,Ill. U5, W14	6.25
SparrowsPoint,Md. B2	6.25
Youngstown U5	6.25
Youngstown Y1	6.75

PLATES, Alloy

Claymont,Del. C22	5.50
Coatesville,Pa. L7	5.50
Fontana,Calif. K1	6.60
Gary,Ind. U5	5.50
Johnstown,Pa. B2	5.50
Munhall,Pa. U5	5.50
Sharon,Pa. S3	5.50
So.Chicago,Ill. U5, W14	5.50
SparrowsPoint,Md. B2	5.50

FLOOR PLATES

Cleveland,Is. R2	5.15
Conshohocken,Pa. A3	5.15
Harrisburg,Pa. C5	5.15
Ind.Harbor,Ind. I-2	5.15
Munhall,Pa. U5	5.15
So.Chicago,Ill. U5	5.15

PLATES, Ingot Iron

Ashland (.15) A10	4.35
Ashland (.1415) A10	4.85
Cleveland,Is. R2	4.70
Warren,O. R2	4.70

BARS

BARS, Hot-Rolled Carbon

Aliquippa,Pa. J5	4.15
Alton,Ill. L1	4.35
Atlanta,Ga. A11	4.35
Bessemer,Ala. T2	4.15
Birmingham,Ala. C15	4.15
Buffalo,(31) R2	4.18
Clairton,Pa. U5	4.15
Cleveland,(31) R2	4.21
Detroit R7	4.30
Ecorse,Mich. G5	4.35
Emeryville,Calif. J7	4.90
Fairfield,Ala. T2	4.15
Fairless,Pa. U5	4.30
Fontana,Calif. K1	4.85
Gary,Ind. U5	4.15
Gadsden,Ala.(31) R2	4.18
Houston,S5	4.50
Ind.Harbor,Ind. I-2, Y1	4.15
Johnstown,Pa. B2	4.15
Kansas City,Mo. S5	4.75
Lackawanna,N.Y. B2	4.15
LosAngeles B3	4.85
Milton,Pa. M18	4.15
Minnequa,Colo. C10	4.60
Niles,Calif. P1	4.85
N.Tonawanda,N.Y. B11	4.45
Pittsburg,Calif. C11	4.85
Pittsburgh J5	4.15
Portland,Oreg. O4	4.50
Seattle B3, N14, P23	4.90
So.Chicago,Ill. W14	4.15
Chicago,(31) R2	4.22
So.Duquesne,Pa. U5	4.15
So.SanFran.,Calif. B3	4.90
Sterling,Ill. (31) N15	4.15
Struthers,O. Y1	4.15
Torrance,Calif. C11	4.85
Weirton,W.Va. W6	4.15
Youngstown U5	4.15
Youngstown,(31) R2	4.20

Bars, Hot-Rolled Alloy

Bethlehem,Pa. B2	4.875
Buffalo R2	4.875
Canton,O. R2, T7	4.875
Clairton,Pa. U5	4.875
Detroit R7	4.975
Ecorse,Mich. G5	5.075
Fairless,Pa. U5	5.025
Fontana,Calif. K1	5.925
Gary,Ind. U5	4.875
Houston,S5	5.275
Ind.Harbor,Ind. I-2, Y1	4.875
Johnstown,Pa. B2	4.875
Kansas City,Mo. S5	5.475
Lackawanna,N.Y. B2	4.875
LosAngeles B3	5.925
Massillon,O. R2	4.875
Midland,Pa. C18	4.875
So.Chicago R2,U5,W14	4.875
So.Duquesne,Pa. U5	4.875
Struthers,O. Y1	4.875
Warren,O. C17	4.875
Youngstown U5	4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5	6.225
Bessemer,Ala. T2	6.225
Bethlehem,Pa. B2	6.225
Clairton,Pa. U5	6.225
Ecorse,Mich. G5	6.425
Fairfield,Ala. T2	6.225
Fontana,Calif. K1	7.475
Gary,Ind. U5	6.225
Ind.Harb.,Ind. Y1	6.725
Ind.Harb.,Ind. I-2	6.225
Johnstown,Pa. B2	6.225
Lackawanna,N.Y. B2	6.225
LosAngeles B3	6.925
Pittsburgh J5	6.225
Seattle B3	6.975
So.Chicago W14	6.225
So.Duquesne,Pa. U5	6.225
So.SanFrancisco B3	6.975
Struthers,O. Y1	6.725
Youngstown U5	6.225

BAR SIZE ANGLES,H.R. CARBON

Bethlehem,Pa. B2	4.35

BAR SIZE ANGLES, S. Shapes

Aliquippa,Pa. J5	4.15
Atlanta,Ga. A11	4.35
Niles,Calif. P1	4.85
SanFrancisco,S7	5.10

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5	5.00
Fontana,Calif. K1	5.925
Gary,Ind. U5	5.00
Houston,S5	5.60
KansasCity,S5	5.66
Youngstown U5	5.00

BARS, Cold-Finished Carbon

Ambridge,Pa. W18	5.20
BeaverFalls,Pa. M12,R2	5.20
Buffalo R2	5.25
Camden,N.J. P13	5.55
Carnegie,Pa. C12	5.20
Chicago W18	5.20
Cleveland A7, C20	5.20
Detroit P17, R7	5.35
Detroit B5	5.40
Donora,Pa. A7	5.20
Elyria,O. W8	5.20
Franklin Park,Ill. N5	5.20
Gary,Ind. R2	5.20
GreenBay,Wis. F7	5.20
Hammond,Ind. L2, M13	5.20
Hartford,Conn. R2	5.75
Harvey,Ill. B5	5.20
LosAngeles,R2, S30	6.65
Mansfield,Mass. B5	5.75
Massillon,O. R2, R8	5.20
Monaca,Pa. S17	5.20
Newark,N.J. W18	5.65
NewCastle,Pa.(17) B4	5.20
Pittsburgh J5	5.20
Plymouth,Mich. P6	5.45
Putnam,Conn. W18	5.75
Readville,Mass. C11	5.75
St.Louis,Mo. M5	5.50
So.Chicago,Ill. W14	5.20
Spring City,Pa. K3	5.65
Struthers,O. Y1	5.20
Waukegan,Ill. A7	5.20
Worcester,Mass. W18	6.10
Youngstown,R5, Y1	5.20

BARS, Cold-Finished Alloy (Turned and Ground)

Cumberland,Md.(3) C19	4.45

BARS, Cold-Finished Alloy

Ambridge,Pa. W18	6.325
BeaverFalls,Pa. M12	6.325
Bethlehem,Pa. B2	6.325
Buffalo R2	6.325
Camden,N.J. P13	6.80
Canton,O. R2, T7	6.325
Carnegie,Pa. C12	6.325
Chicago W18	6.325
Cleveland A7, C20	6.325
Detroit R7	6.425
Detroit P17	6.475
Detroit B5	6.525
Donora,Pa. A7	6.325
Elyria,O. W8	6.325
Fairless,Pa. U5	6.325
Gary,Ind. R2	6.325
Hammond,Ind. L2,M13	6.325
Hartford,Conn. R2	6.775
Harvey,Ill. B5	6.325
Lackawanna,N.Y. B2	6.325
Mansfield,Mass. B5	6.775
Massillon,O. R2, R8	6.325
Midland,Pa. C18	6.325
Monaca,Pa. S17	6.325
Newark,N.J. W18	6.60
Plymouth,Mich. P6	6.525
So.Chicago,Ill. R2,W14	6.325
Spring City,Pa. K3	6.50
Struthers,O. Y1	6.325
Warren,O. C17	6.325
Waukegan,Ill. A7	6.325
Worcester,Mass. A7	6.625
Youngstown,F3, Y1	6.325

BARS, Reinforcing (Fabricators)

Alabama City,Ala. R2	4.15
Atlanta A11	4.35
Birmingham,Ala. C15	4.15
Buffalo R2	4.15
Cleveland R2	4.15
Emeryville,Calif. J7	4.90
Fairfield,Ala. T2	4.15
Fairless,Pa. U5	4.30
Fontana,Calif. K1	4.85
Gary,Ind. U5	4.15
Houston,S5	4.55
Ind.Harbor,Ind. I-2, Y1	4.15
Johnstown,Pa. B2	4.15
KansasCity,Mo. S5	4.75
Lackawanna,N.Y. B2	4.15
LosAngeles B3	4.85
Milton,Pa. M18	4.15
Minnequa,Colo. C10	4.75
Niles,Calif. P1	4.85
Pittsburg,Calif. C11	4.85
Pittsburgh J5	4.15
SandSprings,Okla. S6	5.00
Seattle B3, N14, P23	4.90
So.Chicago,Ill. R2	4.15
So.Duquesne,Pa. U5	4.15
So.SanFrancisco B3	4.90
SparrowsPoint,Md. B2	4.15
Sterling,Ill.(4) N15	4.15
Struthers,O. Y1	4.15
Torrance,Calif. C11	4.85
Youngstown,R2, U5	4.15

BARS, Reinforcing (Fabricated, to consumers)

Johnstown, ¼-1" B2	5.50
KansasCity, S5	6.35
LosAngeles B3	5.50
Marion,Ia. P11	5.55
Seattle N14	5.50
Seattle B3, P23	5.55
So.SanFrancisco B3	5.55
SparrowsPt., ¼-1" B2	5.55
Williamsport,Pa. S19	5.45

RAIL STEEL BARS

Axis,Ala.(5) J8	4.25
Chicago Hts.(3) C2, I-2	4.65
Chicago Hts.(4) C2, I-2	4.15
Ft.Worth,Tex.(26) T4	4.65
Franklin,Pa.(5) P5	4.05
Franklin,Pa.(4) P5	4.15
Marion,O.(3) P11	4.60
Moline,Ill.(3) R2	4.15
Tonawanda(3,4) B12	4.15
Williamsport,Pa.(5) S19	4.25
Williamsport,Pa.(4) S19	5.45

BARS, Wrought Iron

Economy,Pa.(5 R,) B14	10.40
Economy,Pa.(5 R,) B14	12.90
Economy(Staybolt) B14	13.20
McK.Rks.(5 R,) L5	10.40
McK.Rks.(4 R,) L5	14.00
McK.Rks(Staybolt) L5	15.50

SHEETS

SHEETS, Hot-Rolled Steel (18 gage and heavier)

Alabama City,Ala. R2	3.925
Allenport,Pa. P7	3.925
Ashland,Ky.(15) A10	3.925
Cleveland,Is. R2	3.925
Conshohocken,Pa. A3	3.975
Detroit M1	4.125
Ecorse,Mich. G5	4.125
Fairfield,Ala. T2	3.925
Fairless,Pa. U5	3.975
Fontana,Calif. K1	4.70
Gary,Ind. U5	3.925
Granite City,Ill. G4	4.125
Ind.Harbor,Ind. I-2, Y1	3.925
Irvin,Pa. U5	3.925
Kokomo,Ind. C16	4.125
Mansfield,Mass. B5	4.675
Middletown,O. A10	3.925
Monessen,Pa. P7	3.925
Niles,O. N15	3.925
Portsmouth,P12	3.925
Riverdale,Ill. A1	3.925
Sharon,Pa. S3	3.925
So.Chicago,Ill. R2,W14	3.925
Sparrows Point,Md. B2	3.925
Steubenville,O. W10	3.925
Warren,O. R2	3.925
Weirton,W.Va. W6	3.925
Youngstown,R2, U5, Y1	3.925

Kokomo,Ind. C16 ... 4.025
Lackawanna,N.Y. B2 ... 3.925
Munhall,Pa. U5 ... 3.925
Newport,Ky. N9 ... 3.925
Niles,O. N12 ... 3.975
Pittsburg,Calif. C11 ... 4.625
Pittsburgh,Pa. J5 ... 3.925
Portsmouth,O. P12 ... 3.925
Riverdale,Ill. A1 ... 3.925
Sharon,Pa. S3 ... 3.925
So.Chicago,Ill. W14 ... 3.925
SparrowsPoint,Md. B2 ... 3.925
Steubenville,O. W10 ... 3.925
Torrance,Calif. C11 ... 4.625
Warren,O. R2 ... 3.925
Weirton,W.Va. W6 ... 3.925
Youngstown,O.,Yl ... 3.925

SHEETS, H.R. (19 gage)

AlabamaCity,Ala. R2 ... 5.225
Dover,O. R1 ... 5.05
Kokomo,Ind. C16 ... 5.025
Mansfield,O. E6 ... 5.05
Niles,O. N12 ... 4.775
Torrance,Calif. C11 ... 5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland,O. R2 ... 5.90
Conshohocken,Pa. A3 ... 5.90
Ecorse,Mich. G5 ... 6.10
Fairfield,Ala. T2 ... 5.90
Fairless,Pa. U5 ... 5.95
Fontana,Calif. K1 ... 6.675
Gary,Ind. U5 ... 5.90
Ind.Harbor,Ind. I-2 ... 5.90
Ind.Harbor,Ind. Y1 ... 6.40
Irvin,Pa. U5 ... 5.90
Lackawanna,N.Y. B2 ... 5.90
Munhall,Pa. U5 ... 5.90
Pittsburgh,Pa. J5 ... 5.90
Sharon,Pa. S3 ... 5.90
So.Chicago,Ill. U5 ... 5.90
SparrowsPoint,Md. B2 ... 5.90
Warren,O. R2 ... 5.90
Weirton,W.Va. W6 ... 5.90
Youngstown,O. U5 ... 5.90
Youngstown,O. Y1 ... 6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ... 4.175
Cleveland,O. R2 ... 4.525
Ind.Harbor,Ind. I-2 ... 4.175
Warren,O. R2 ... 4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 ... 4.775
Cleveland,O. R2 ... 4.775
Ecorse,Mich. G5 ... 4.975
Fairfield,Ala. T2 ... 4.775
Fairless,Pa. U5 ... 4.825
Follansbee,W.Va. F4 ... 4.775
Fontana,Calif. K1 ... 5.575
Gary,Ind. U5 ... 4.775
GraniteCity,Ill. G1 ... 4.975
Ind.Harbor,Ind. I-2,Y1 ... 4.775
Irvin,Pa. U5 ... 4.775
Lackawanna,N.Y. B2 ... 4.775
Middletown,O. A10 ... 4.775
Pittsburg,Calif. C11 ... 5.725
Pittsburgh,Pa. J5 ... 4.775
Portsmouth,O. P12 ... 4.775
SparrowsPoint,Md. B2 ... 4.775
Steubenville,O. W10 ... 4.775
Warren,O. R2 ... 4.775
Weirton,W.Va. W6 ... 4.775
Youngstown,O. Y1 ... 4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland,O. R2 ... 7.225
Ecorse,Mich. G5 ... 7.425
Fairless,Pa. U5 ... 7.275
Fontana,Calif. K1 ... 8.275
Gary,Ind. U5 ... 7.225
Ind.Harbor,Ind. Y1 ... 7.725
Irvin,Pa. U5 ... 7.225
Lackawanna,(37) B2 ... 7.225
Pittsburgh,Pa. J5 ... 7.225
SparrowsPoint,(38) B2 ... 7.225
Warren,O. R2 ... 7.225
Weirton,W.Va. W6 ... 7.225
Youngstown,O. Y1 ... 7.725

SHEETS, Cold-Rolled Ingot Iron

Cleveland,O. R2 ... 5.375
Middletown,O. A10 ... 5.275
Warren,O. R2 ... 5.375

SHEETS, Culvert

	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.325	
Canton,O. R2	6.475	6.925
Fairfield,T2	6.075	6.325
Gary,Ind. U5	6.075	6.325
Ind.Harbor,I-2	6.075	6.325
Irvin,Pa. U5	6.075	6.325
Kokomo,Ind. C16	6.175	
MartinsFerry,O. W10	6.075	
Pittsburg,Calif. C11	6.825	
SparrowsPt.,B2	6.075	
Torrance,Calif. C11	7.975	

SHEETS, Culvert

	Pure Iron
Ashland,Ky. A10	6.575
Fairfield,Ala. T2	6.325
MartinsFerry,O. W10	6.325

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2 ... 5.275
Ashland,Ky.(8) A10 ... 5.275
Canton,O. R2 ... 5.275
Delphos,O. N16 ... 5.775
Dover,O. R1 ... 5.275
Fairfield,Ala. T2 ... 5.275
GraniteCity,Ill. G1 ... 5.475
Ind.Harbor,Ind. I-2 ... 5.275
Irvin,Pa. U5 ... 5.275
Kokomo,Ind. C16 ... 5.475
MartinsFerry,O. W10 ... 5.275
Niles,O. N12 ... 5.275
Pittsburg,Calif. C11 ... 6.025
SparrowsPoint,Md. B2 ... 5.275
Steubenville,O. W10 ... 5.275
Torrance,Calif. C11 ... 6.275
Weirton,W.Va. W6 ... 5.275

(Based on 1c zinc

SHEETS, Galvanized No. 10 High-Strength Low-Alloy

Irvin,Pa. U5 ... 7.525
SparrowsPoint(39) B2 ... 8.075

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10 ... 5.525
Canton,O. R2 ... 6.025

SHEETS, Galvannealed Steel

Canton,O. R2 ... 5.825
Irvin,Pa. U5 ... 5.925
Kokomo,Ind. C16 ... 5.825
Niles,O. N12 ... 5.825

(Based on 1c zinc

SHEETS, ZINCGRIP Steel

Butler,Pa. A10 ... 5.525
Middletown,O. A10 ... 5.525

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10 ... 5.775
Middletown,O. A10 ... 5.775

SHEETS, Electrogalvanized

Cleveland,R2 (28) ... 6.125
Niles,O. R2 (28) ... 6.125
Weirton,W.Va. W6 ... 5.975

SHEETS, ALUMINIZED

Butler,Pa. A10 ... 8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ... 5.175
Cleveland,R2 ... 5.175
Gary,Ind. U5 ... 5.175
GraniteCity,Ill. G1 ... 5.375
Ind.Harbor,Ind. I-2 ... 5.175
Irvin,Pa. U5 ... 5.175
Middletown,O. A10 ... 5.175
Niles,O. N12 ... 6.525
Warren,O. R2 ... 5.175
Youngstown,O. Y1 ... 5.175

BLUED STOCK, 29 ga

Follansbee,W.Va. F4 ... 7.30
Follansbee(23) F4 ... 7.175
Yorkville,O. W10 ... 7.20

SHEETS, Long Terne Steel (Commercial Quality)

BeechBott'm,W.Va. W10 ... 5.675
Gary,Ind. U5 ... 5.675
Mansfield,O. E6 ... 5.675
Middletown,O. A10 ... 5.675
Niles,O. N12 ... 5.675
Weirton,W.Va. W6 ... 5.675

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ... 6.075

SHEETS, Well Casing

Fontana,Calif. K1 ... 6.20

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ... 3.925
Allenport,Pa. P7 ... 3.925
Alton,Ill. L1 ... 4.10
Ashland,Ky.(8) A10 ... 3.925
Atlanta,Ill. A11 ... 4.125
Bessemer,Ala. T2 ... 3.925
Birmingham,Ala. C15 ... 3.925
Bridgeport,Conn.(10)S15 ... 3.95
Buffalo(27) R2 ... 3.925
Carnegie,Pa. S18 ... 4.125
Conshohocken,Pa. A3 ... 4.80
Detroit,M1 ... 4.125
Ecorse,Mich. G5 ... 4.125
Fairfield,Ala. T2 ... 3.925
Fontana,Calif. K1 ... 4.70
Gary,Ind. U5 ... 3.925
Houston,Tex. S8 ... 4.325
Ind.Harbor,Ind. I-2,Y1 ... 3.925
Johnstown,Pa.(25) B2 ... 3.925
Kansas City,Mo.(9) S8 ... 4.525
Lackawanna,N.Y.(25) B2 ... 3.925
LosAngeles(25) B3 ... 4.675
Milton,Pa. M18 ... 3.925
Minnequa,Colo. C10 ... 3.925
NewBritain,(10) S15 ... 4.15
N.Tonawanda,N.Y. B11 ... 3.925
Pittsburg,Calif. C11 ... 4.675
Portsmouth,O. P12 ... 3.925
Riverdale,Ill. A1 ... 3.925
San Francisco S7 ... 4.10
Seattle(25) B3 P23 ... 4.925
Seattle N14 ... 4.925
Sharon,Pa. S3 ... 3.925
So.Chicago,Ill. W14 ... 3.925
So.SanFrancisco(25)B3 ... 4.675
SparrowsPoint,Md. B2 ... 3.925
Torrance,Calif. C11 ... 4.675
Warren,O. R2 ... 3.925
Weirton,W.Va. W6 ... 3.925
Youngstown,O. U5 ... 3.925

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15 ... 6.45
Carnegie,Pa. S18 ... 6.40
Fontana,Calif. K1 ... 7.80
Gary,Ind. U5 ... 6.40
Houston,Tex. S8 ... 6.80
Kansas City,Mo. S8 ... 7.00
LosAngeles B3 ... 7.60
NewBritain,Conn.(10)S15 ... 6.45
Sharon,Pa. S3 ... 6.40
So.Chicago,Ill. W14 ... 6.40
Youngstown,O. U5 ... 6.40

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 ... 5.95
Conshohocken,Pa. A3 ... 5.90
Ecorse,Mich. G5 ... 6.15
Fairfield,Ala. T2 ... 5.95
Fontana,Calif. K1 ... 7.05
Gary,Ind. U5 ... 5.90
Ind.Harbor,Ind. I-2 ... 5.95
Ind.Harbor,Ind. Y1 ... 6.45
Lackawanna,N.Y. B2 ... 6.00
LosAngeles(25) B3 ... 6.70
Seattle(25) B3 P23 ... 6.95
Sharon,Pa. S3 ... 5.95
So.SanFrancisco(25) B3 ... 6.70
SparrowsPoint,Md. B2 ... 6.00
Warren,O. R2 ... 5.95
Weirton,W.Va. W6 ... 5.95
Youngstown,O. U5 ... 5.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ... 4.175
Warren,O. R2 ... 4.525

STRIP, Cold-Rolled Carbon

Anderson,Ind. G5 ... 5.45
Bridgeport,Conn.(10) S15 ... 5.45
Cleveland,A7 Ex ... 5.45
Dearborn,Mich. D2 ... 5.65
Detroit,D2,M1,P20 ... 5.65
Dover,O. G6 ... 5.45
Ecorse,Mich. G5 ... 5.65
Follansbee,W.Va. F4 ... 5.45
Fontana,Calif. K1 ... 7.35
Frankfort,Ill. T6 ... 5.70
Ind.Harbor,Ind. I-2 ... 5.70
Indianapolis,C8 ... 5.60
Lackawanna,N.Y. B2 ... 5.45
LosAngeles C1 ... 7.50
Mattapan,Mass. T6 ... 6.10
Middletown,O. A10 ... 5.45
NewBedford,Mass. R10 ... 6.00
NewBritain,(10) S15 ... 5.75
NewCastle,Pa. B11,E6 ... 5.45
NewHaven,Conn. A7 ... 6.20
NewHaven,Conn. D2 ... 5.90
Pawtucket,R.I. N8,R3 ... 6.10
Pittsburgh,J5 ... 5.45
Riverdale,Ill. A1 ... 5.70
Rome,N.Y.(32) R6 ... 5.45
Sharon,Pa. S3 ... 5.45
SparrowsPoint,Md. B2 ... 5.45
Trenton,N.J. R3 ... 7.00
Wallingford,Conn. W2 ... 5.90
Warren,O.(26) T6 ... 5.45
Warren,O. R3,R2 ... 5.45
Weirton,W.Va. W6 ... 5.45
Worcester,Mass. A7 ... 6.30
Youngstown,O. S. Y1 ... 5.45

STRIP, Cold-Rolled Alloy Steel

Carnegie,Pa. S18 ... 12.00
Cleveland,A7 ... 12.00
Dover,O. G6 ... 12.00
Fontana,Calif. K1 ... 13.65
Harrison,N.J. C18 ... 12.00
Pawtucket,R.I.(12) N8 ... 12.15
Pawtucket,R.I.(12) N8 ... 12.45
Sharon,Pa. S3 ... 12.00
Worcester,Mass. A7 ... 12.30
Youngstown,O. S. ... 12.00

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland,T2 ... 7.80
Cleveland,A7 ... 8.15
Dearborn,Mich. D2 ... 7.90
Dover,O. G6 ... 8.00
Ecorse,Mich. G5 ... 8.35
Lackawanna,N.Y. B2 ... 8.15
Pittsburgh,J5 ... 7.80
Sharon,Pa. S3 ... 7.65
SparrowsPoint,Md. B2 ... 8.15
Warren,O. R2 ... 7.60
Weirton,W.Va. W6 ... 8.15
Youngstown,O. Y1 ... 8.30

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 ... 6.05

STRIP, Electrogalvanized

Dover,O. G6 ... 5.45
Warren,O. B9, T6 ... 5.45
Weirton,W.Va. W6 ... 5.45
Youngstown,O. S. ... 5.70

TIGHT COOPERAGE HOOP

Atlanta,A11 ... 4.65
Riverdale,Ill. A1 ... 4.50
Sharon,Pa. S3 ... 4.35
Youngstown,O. S. ... 4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Blaw-Knox Co.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div. Sharon Steel Corp.
B10 E. & G. Brooke Iron Wire Spencer Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co. Div. Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Chatter Wire Products
C24 G. O. Carlson Inc.
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Dresser & Sons, Henry
D6 Dunner Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.
E1 Eastern Gas & Fuel Assn.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.
G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H2 Helical Tube Co.
I-1 Ingo Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J2 Jessop Steel Co.
J4 Johnson Steel&Wire Co.
J5 Jones & Laughlin Steel
J6 Justyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockfast Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Mellott Co.
M6 Mercer Pipe Div. Sawhill Tubular Products
M8 Mid States Steel & Wire
M12 Multiup Steel Products
M13 Monarch Steel Co.
M16 Md. Pipe & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div. Merritt-Chapman&Scott
N2 National Supply Co.
N3 National Tube Div.
N4 Severn Steel & Wire Co.
N6 Newkirk Electric Steel
N8 Newman Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nilson Steel Ball Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O1 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Peerless Drawn Steel
P6 Pittsburgh Chain&Crane
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div. Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reflance Div. Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forging Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T8 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.
U1 Universal Cyclops Steel
U3 United States Steel Corp.
U5 U. S. Pipe & Foundry
U7 Ulrich & Soltz, Fred
V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Va. Nail & Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div. Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W16 Wyckoff Steel Co.
W18 Worcester Pressed Steel
Y1 Youngstown Steel&Tube

STRIP, Cold-Finished	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Spring Steel (Annealed)					
R.I.Steel Cont.(10)	8.15	7.65	8.60	10.55	12.85
Bristol,Conn. W1			8.90	10.85	
Carnegie,Pa. R15		7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Cleveland C7		7.65	8.60	10.55	12.85
Dearborn,Mich. D3	5.65	7.85	8.80		
Detroit D2	5.65	7.85	8.80	10.55	
Dover,O. G6	5.45	7.65	8.60	10.55	12.85
Franklin Park,Ill. T6	5.70	7.80	8.75	10.70	13.00
Harrison,N.J. C18			8.90	10.85	13.15
Indianapolis C5		7.80	8.60	10.55	
Mattapan,Mass. T6	6.10	7.95	8.90	10.85	13.15
New Brit. Conn.(10)	5.75	7.65	8.60	10.55	12.85
New Castle,Pa. R4	5.45	7.65	8.60		
New Castle,Pa. R5	5.45	8.00	8.60	10.55	12.85
New Haven,Conn. D2	5.90	7.95	8.90	10.85	
New York W3		7.95	8.90	10.85	13.15
Pawtucket,R.I.(11)	N8	7.65	8.60	10.55	12.85
Pawtucket,R.I.(12)	N8	6.10	7.95	8.90	10.85
Sharon,Pa. S1	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5		7.95	8.90	10.85	13.15
Wallingford,Conn. W2	5.90	7.95	8.90	10.85	13.15
Warren,O. T5	5.45	7.65	8.60	10.55	12.85
Weirton,W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass. A7	6.30	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.10	7.95	8.90	10.85	13.15
Youngstown C8		7.65	8.60	10.55	12.85
Spring Steel (Tempered)					
Buffalo W12			12.50		
Bristol,Conn. W1			12.50	15.00	
Franklin Park,Ill. T6			13.25	15.75	18.75
Harrison,N.J. C18			12.50	15.00	18.00
New York W3			12.50	15.00	18.00
Trenton,N.J. R5			12.50	15.00	18.00
Worcester,Mass. T6			12.50	15.00	18.00
Worcester,Mass. W12			12.50		
Youngstown C8			12.85	15.35	18.35

SILICON STEEL

H.R. SHEETS (22 gage) (Cut Lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10			8.75	9.75	10.65
Brackenridge,Pa. A4			8.75	9.75	10.65
Indiana Harbor,Ind. I-2	7.85	8.15	8.75	9.75	
Mansfield,O. R6	7.85	8.15	8.75	9.75	10.65
Newport,Ky. N9	7.85	8.15	8.75	9.75	10.65
Niles,O. N12	7.85	8.15	8.75	9.75	
Vandergrift,Pa. U5		8.15	8.75	9.75	10.65
Warren,O. R2	7.85	8.15	8.75	9.75	
Zanesville,O. A10		8.15	8.75	9.75	10.65

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semi processed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Granite City,Ill. G4	8.25*	8.60*	9.20*	10.20*	
Indiana Harbor,Ind. I-2	8.05	8.40*	9.00*		
Vandergrift,Pa. U5	8.05*	8.90	9.50	10.50	11.40
Warren,O. R2	8.05*	8.90	9.50	10.50	11.40

H.R. SHEETS (22 Gage) (Cut Lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.60	12.15	12.65	13.65
Brackenridge,Pa. A4	11.60			
Newport,Ky. N9	11.60			
Vandergrift,Pa. U5	11.60	12.15	12.65	13.65
Zanesville,O. A10	11.60	12.15	12.65	13.65

C.R. COILS & CUT LENGTHS (22 Ga.)	T-100	T-90	T-80	T-73	T-72
Butler,Pa. A10			16.25	16.75	
Vandergrift,Pa. U5	13.65	14.65	16.25	16.75	12.35‡
Warren,O. R2					12.35‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
Granite City,Ill. G4	7.60	7.85	8.25
Indiana Harbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
Sparrows Point,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
Granite City,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
Sparrows Point,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
Granite City,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

WIRE

WIRE, Manufacturers Bright, Low Carbon	
Alabama City,Ala. R2	5.525
Aliquippa,Pa. J5	5.25
Alton,Ill. L1	5.70
Atlanta,A11	5.72
Bartonville,Ill. K4	5.625
Buffalo W12	5.25
Chicago W13	5.25
Cleveland A7, C20, R2	5.25
Crawfordsville,Ind. M8	5.625
Joliet,Ill. A7	5.25
Johnstown,Pa. B2	5.25
Duluth,Minn. A7	5.25
Fairfield,Ala. T2	5.25
Fostoria,O. (2) S1	5.75
Houston,Tex. S5	5.25
Jacksonville,Fla. M8	6.90
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
Kansas City,Mo. S5	6.125
Kokomo,Ind. C16	5.625
Los Angeles,B3	6.125
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.625
No.Tonawanda,B11	5.525
Palmer,Mass. W12	5.525
Pittsburg,Calif. C11	6.175
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.San Francisco C10	6.475
Sparrows Point,Md. B2	5.625
Sterling,Ill.(1) N15	5.525
Struthers,O. Y1	5.525
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
Los Angeles,B3	7.875
Millbury,Mass.(12) N6	7.225
Minnequa,Colo. C10	7.175
Monessen,Pa. P7, P16	6.925
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.San Fran. C10	7.875
Sparrows Pt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester,A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
Los Angeles,B3	7.575
Minnequa,Colo. C10	6.80
Monessen,Pa. P7, P16	6.625
New Haven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.San Francisco C10	7.575
Sparrows Point,Md. B2	6.725
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving(18 Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.65
Fostoria,O. S1	10.55
Jacksonville,Fla. M8	11.08
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Minnequa,Colo. C10	10.30
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.San Francisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7, T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Buffalo W12	9.50
Johnstown,Pa. B2	9.50
Minnequa,Colo. C10	9.625
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Portsmouth,O. D2	9.50
Roebling,N.J. R5	9.80
Sparrows Pt.,Md. B2	9.60

ROPE WIRE	(A)
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.55
Sparrows Pt. B2	9.45
Struthers,O. Y1	9.35
Worcester,J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.55
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
Franklin Park,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P7, P16	7.45
Pawtkt.,R.I.(12) N8	7.75
Trenton,N.J. R5	7.55
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld	Galv.
Ala.City,R2	6.675	7.075**
Aliquippa,J5	6.675	7.20*
Atlanta,A11	6.775	7.30
Bartonville(48)K4	6.775	7.275
Buffalo W12	6.675	7.075†
Cleveland A7	6.675	
Crawfordsville M8	6.775	7.30
Donora,Pa. A7	6.675	7.075†
Duluth,Minn. A7	6.675	7.075†
Fairfield T2	6.675	7.075†
Houston,Tex. S5	7.675	7.475
Jacksonville,Fla. M8	7.20	7.73
Johnstown B2(48)	6.675	7.225*
Johnstown B2(48)	6.675	7.225*
Joliet,Ill. A7	6.675	7.075†
Kansas City,Mo. S5	7.275	7.675
Kokomo C16	6.775	7.175†
Los Angeles, B3	7.625	
Minnequa,Colo. C10	6.925	7.325**
Monessen P7(48)	6.675	7.225
Palmer,W12	6.975	7.375†
Pitts.,Calif. C11	7.625	8.025†
Portsmouth,O. P12	6.675	
Rankin,A7	6.675	7.075†
So.Chicago R2	6.675	7.075**
S.S.Fr.(48)C10	7.625	8.025**
Sparrows Pt.B2(48)	6.775	7.325*
Sterling(1) N15	6.675	7.20
Struthers,O. Y1	6.675	7.175
Worcester A7	6.975	

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Coil	
Ala.City,Ala. R2	14†**
Ala.City, 17 ga. R2	23½**
Ala.City, 18 ga. R2	24½**
Aliquippa,Pa 9-14½ ga. J5	143*
Atlanta A11	145
Bartonville,Ill K4	144
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga. 6" B2	234
Johnstown 4" B2	237
Joliet,Ill. A7	140†
Kansas City,Mo. S5	152
Kokomo,Ind. C16	142†
Minnequa,Colo. C10	143**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	143

† Based on 5c zinc; * 11c zinc. ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
Alabama City,Ala. R2	149
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
Kansas City,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.San Fran.,Calif. C10	173
Sparrows Point,Md. B2	151
Sterling,Ill.(1) N15	149

WIRE, Barbed	Col.
Alabama City R2	155**
Aliquippa J5	150**
Atlanta A11	158
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	158
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156*
Joliet,Ill. A7	153†
Kansas City,Mo. S5	165
Kokomo,Ind. C16	155†
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	154†
So.Chicago,Ill. R2	159**
S.San Francisco C10	179**
Sparrows Point,Md. B2	158*
Sterling,Ill. (1) N15	156

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WIRE (16 gage)	An'ld	Galv.
Ala.City R2	12.50	14.05**
Aliquippa J5	12.50	14.30*
Bartonville K4	12.60	14.35
Buffalo W12	12.50	
Cleveland A7	12.50	
Crawfordsville M8	12.50	14.30
Fostoria,O. S1	12.60	14.15
Johnstown B2	12.50	14.35*
Kokomo C16	12.60	14.15†
Minnequa C10	12.75	14.45**
Palmer,Mass W12	12.50	14.05†
Pitts.,Calif. C11	12.85	14.40†
Sparrows Pt. B2	12.60	14.45*
Sterling(1) N15	12.50	14.30
Waukegan A7	12.50	14.05†
Worcester A7	12.80	

* Based on 11c zinc; † 5c zinc; ** Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7)	Col.
Alabama City,Ala. R2	131
Aliquippa,Pa. J5	131
Atlanta A11	133
Bartonville,Ill. K4	133
Chicago,Ill. W13	131
Cleveland A6	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
Kansas City,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
Sparrows Pt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, CUT (100 lb. keg) To dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished Stock To dealers & mfrs. (7)	Col.
Alabama City,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	135
Bartonville,Ill. K4	135
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
Sparrows Pt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

FENCE POSTS

	Col.
Chicago Hts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	145
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. B2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	145
Williamsport,Pa. S19	148

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size, Inches	2		2½		3		3½		4		5		6	
List, Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (2)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (1)	15.75		19.75		22.25		23.75		23.75		23		25.5	
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
Youngstown, Y1 (**)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (***)	15.75	1.5	19.75	3.5	22.25	6.0	23.75	7.5	23.75	7.5	23	7.5	25.5	6.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size, Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List, Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (1)							26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 (*)							24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
Benwood, W. Va. W10(**)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	19.5	34.75	20.25
Butler, Pa. F6	26.5	1.75	19.5	+2.75	12.5	+6.25										
Etna, Pa. N2 (*)							26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fairless, Pa. N3							24.25		27.25		29.75		32.25		32.75	
Fontana, Calif. K1 (*)							13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor, Y1 (**)							24.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)							26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S1 (1)	26.5	0.25	19.50	+1.25	12.5	+3.5										
Sharon, Pa. M6							26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Sparrows Pt., Md. B2 (1)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (***)							26.25	12	29.25	16	31.75	19.5	34.25	20.0	34.75	21.0
Youngstown Y1 (**)							26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 (1)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5

Size, Inches	2		2½		3		3½		4	
List, Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (1)	35.25	20.5	36.75	20	36.25	20				
Alton, Ill. L1 (*)	33.25	18.75	34.75	18	34.75	18				
Benwood, W. Va. W10(**)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Etna, Pa. N2 (*)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fairless, Pa. N3	33.25		34.75		34.75		25.75		25.75	
Fontana, Calif. K1 (*)	22.25	7	23.75	7	23.75	7				
Ind. Harbor, Ind. Y1 (**)	34.25	19	35.75	19	35.75	19				
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23				
Sharon, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5				
Sparrows Pt., Md. B2 (1)	32.25	18.5	34.75	18	34.75	18	24.75	8.5	24.75	8.5
Youngstown R2 (***)	35.25	21.5	36.75	21.0	36.75	21.0	27.75	11.5	27.75	11.5
Youngstown Y1 (**)	35.25	20	36.75	20	36.75	20				
Wheatland, Pa. W9 (1)	35.25	20	36.75	20	36.75	20				

Galvanized pipe discounts based on zinc price of: (1), 11c; (2), 11c to under 12c; (*), 12c to under 13c; (**), 10.50c to 11.50c; (***), 9.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollar per 100 ft, mill, minimum wall thickness, cut lengths 10 to 24 ft, inclusive

O.D. In	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	16.02	18.11	
1¼	13	22.02	24.12	
1½	13	20.61	24.31	26.66
1¾	13	24.46	28.82	29.66
2	13	27.31	32.18	32.41
2¼	13	30.90	37.15	35.96
2½	12	33.43	39.42	38.41
2¾	12	36.82	44.11	42.70
3	12	39.87	48.09	45.66
3½	12	42.92	51.28	51.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lbs. Under
Bessemer, Pa. U5	4.324	4.224	4.274	5.20
Ensley, Ala. T2	4.324	4.224		5.20
Fairfield, Ala. T2				
Gary, Ind. U5	4.324	4.224	4.274	
Huntington, W. Va. W7				5.20
Ind. Harbor, Ind. I-2	4.324	4.224	4.274	
Johnstown, Pa. B2				5.20
Lackawanna, N.Y. B2	4.324	4.224		
Minnequa, Colo. C10	4.324	4.224		5.20
Steelton, Pa. B2	4.324	4.224		
Williamsport, Pa. S19				5.20

TIE PLATES	
Bessemer, Pa. T2	3.25
Ensley, Ala. T2	3.25
Fairfield, Ala. T2	3.25
Ind. Harbor, Ind. I-2	3.25
Lackawanna, N.Y. B2	3.25
Minnequa, Colo. C10	3.25
Steelton, Pa. B2	3.25
Torrance, Calif. C11	3.25

STANDARD TRACK SPIKES	
Bessemer, Pa. T2	3.25
Ensley, Ala. T2	3.25
Fairfield, Ala. T2	3.25
Ind. Harbor, Ind. I-2	3.25
Lackawanna, N.Y. B2	3.25
Minnequa, Colo. C10	3.25
Steelton, Pa. B2	3.25
Torrance, Calif. C11	3.25

TRACK BOLTS (20) Treated	
Bessemer, Pa. T2	11.00
Ensley, Ala. T2	11.00
Gary, Ind. U5	11.00
Geneva, Utah U5	11.00
Minnequa, Colo. C10	11.00
Pittsburgh, Pa. P14	11.00
Seattle, Wash. B5	11.00

JOINT BARS	
Bessemer, Pa. T2	3.25
Fairfield, Ala. T2	3.25
Ind. Harbor, Ind. I-2	3.25
Gary, Ind. U5	3.25
Lackawanna, N.Y. B2	3.25
Minnequa, Colo. C10	3.25
Steelton, Pa. B2	3.25

AXLES	
Ind. Harbor, Ind. S13	6.50
Johnstown, Pa. B2	6.50

RIVETS

Base per keg, shipping point, to job

	List
Bessemer, Pa. T2	
Ensley, Ala. T2	
Fairfield, Ala. T2	
Gary, Ind. U5	
Geneva, Utah U5	
Ind. Harbor, Ind. I-2	
Johnstown, Pa. B2	
Lackawanna, N.Y. B2	
Minnequa, Colo. C10	
Pittsburgh, Pa. P14	
Seattle, Wash. B5	

WASHERS, WROUGHT

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

HEADLESS SET SCREWS

STEEL STOVE BOLTS

HEXAGON CAP SCREWS

NUTS

SQUARE HEAD SET SCREWS

METAL POWDERS

Five pound, F.o.b. shipping point in 100 lots or more, except as otherwise noted

Domestic (Swedish)	
Coeur d'Alene, Idaho	
N.J. in bags	11.25
Electrolytic iron	
Melting stock (99.91%)	
Fe, irregular fine mesh, 95% thru 100 mesh	23.00
Annealed (99.5% Fe)	42.50
Unannealed (99.5%)	
Fer	36.50
Unannealed (99.6%)	
Fer, minus 325 mesh	53.50
Powder Flakes (minus 16 plus 100 mesh)	31.00
Carbonyl iron	
97.5-99.5% (see 5 to 10 microns)	63.00 to 110.00
Aluminum	
Atomized 500 lb drums, freight allowed	
Grade A	31.00
Fine lots	33.00
Aluminum, 100 lb lots	32.00*
Bismuth, ton lots	
Boron, 1 lb	28.25-37.50
Bronze, 5 lots	30.00-60.00
Cadmium	
Chromium	
Electrolytic	13.50*
Reduced	13.50*
Lead	7.00*
Magnesium	54.00-56.00
Manganese	
Minus 35 mesh	61.00
Minus 100 mesh	65.00
Minus 200 mesh	42.00
Nickel, unannealed	95.00
Nickel powder, 5 lots	11.00 to 60
Nickel, silver, 5 lots	16.75**
Phosphor Bronze	
Fine lots	35.00
Coarse lots	31.00
Solder	5.00*
Stainless Steel, 302	31.00
Tin	11.50*
Zinc, 5 lots, 1 to 99	23.75†
Zinc, 5 lots, 100 to 499	22.75†
Tungsten	Dollars
Melting grade, 99%	
100 to 200 mesh	
200 to 325 mesh	
325 and over	1.75
Less than 100 lots	2.10
Tungsten, electrolytic	
99.9%	3.50

*Prices f.o.b. mill. †Freight equalized with Pittsburgh on composition. Higher prices for quantities less than 5,000 lbs. **41% Cu, 59% Zn, 1% Mn.

Footnotes

(1) Aliquippa base. (2) Ambridge, Pa. Gulf base. (*) Minnequa base. (**) Youngstown base. (***) Wheatland base. (1) Pittsburgh base. (2) Chicago or Joliet base. (3) Cleveland base. (4) Pittsburgh & Joliet base. (5) Worcester, Mass. base. (6) Add 0.25c to 11 Ga. & heavier. (7) Base 0.15 to 0.249 inch, inclusive. (8) Base 0.142 and under. (9) Base 0.142 and under. (10) Base 0.15 and heavier. (11) Base 0.15 and heavier. (12) Buffalo base. (13) To jobbers, deduct 20c. (14) To jobbers, deduct 10c. (15) 12 and narrower. (16) 14" and narrower. (17) Over 4 & under 48" A harmer. (18) Over 4 & under 8" A harmer. (19) 16" and narrower. (20) Lighter than 8 Ga. & heavier. (21) Bar mill basis. (22) Tri-State base. (23) Bar mill base. (24) Richmond base. (25) Youngstown base. (26) Sharon, Pa. universal mill base. (27) Base 0.230 inch and heavier, to jobbers, delivered within 60 days. (28) Base 0.229 inch and lighter, to jobbers, delivered within 60 days. (29) Base 0.203 inch and heavier, to jobbers, delivered within 60 days. (30) Base 0.202 inch and lighter, to jobbers, delivered within 60 days. (31) Base 0.177 inch and heavier, to jobbers, delivered within 60 days. (32) Base 0.176 inch and lighter, to jobbers, delivered within 60 days. (33) Base 0.153 inch and heavier, to jobbers, delivered within 60 days. (34) Base 0.152 inch and lighter, to jobbers, delivered within 60 days. (35) Base 0.127 inch and heavier, to jobbers, delivered within 60 days. (36) Base 0.126 inch and lighter, to jobbers, delivered within 60 days. (37) Base 0.107 inch and heavier, to jobbers, delivered within 60 days. (38) Base 0.106 inch and lighter, to jobbers, delivered within 60 days. (39) Base 0.091 inch and heavier, to jobbers, delivered within 60 days. (40) Base 0.090 inch and lighter, to jobbers, delivered within 60 days. (41) Base 0.077 inch and heavier, to jobbers, delivered within 60 days. (42) Base 0.076 inch and lighter, to jobbers, delivered within 60 days. (43) Base 0.063 inch and heavier, to jobbers, delivered within 60 days. (44) Base 0.062 inch and lighter, to jobbers, delivered within 60 days. (45) Base 0.049 inch and heavier, to jobbers, delivered within 60 days. (46) Base 0.048 inch and lighter, to jobbers, delivered within 60 days. (47) Base 0.035 inch and heavier, to jobbers, delivered within 60 days. (48) Base 0.034 inch and lighter, to jobbers, delivered within 60 days. (49) Base 0.028 inch and heavier, to jobbers, delivered within 60 days. (50) Base 0.027 inch and lighter, to jobbers, delivered within 60 days. (51) Base 0.021 inch and heavier, to jobbers, delivered within 60 days. (52) Base 0.020 inch and lighter, to jobbers, delivered within 60 days. (53) Base 0.016 inch and heavier, to jobbers, delivered within 60 days. (54) Base 0.015 inch and lighter, to jobbers, delivered within 60 days. 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STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes, H.R. & C.F. H.R. Strip	H.R. Bars, Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	28.75	36.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	36.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L			36.75			42.75	45.25	54.25	49.00
306	19.50	25.50		36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	33.75	43.25	49.25	50.50	53.75	63.50	62.00	
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314							69.00	74.50	
316	23.00	30.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L			52.50			61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	45.25	40.75	42.00	42.00	46.00	55.50	54.50
330			58.00			68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	48.50	46.75	51.25	60.75	56.25
403			27.00	30.75		32.00	34.25	44.00	41.25
405	16.50	21.75	26.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416			24.50	28.25		29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F		18.75	25.00	28.75		29.75	31.00	44.00	44.00
431	14.50	28.50	23.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C		28.50	29.25	34.00		35.00	38.50	49.25	52.75
442			28.00			30.50	35.25	48.25	47.75
446			33.75	38.25	53.00	39.50	40.75	59.75	71.00
501			14.00	14.50	21.25	16.00	18.25	30.50	29.00
502			15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Fred Ulbrich & Sons; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302		31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	143.00
316	32.60	37.70-42.75	42.75	.....
317	37.00	42.20	.....	.....
321	29.80	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	.....
410	22.50	30.10	.....	.....
430	22.50	30.10	.....	.....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	.....
Monel	38.90	51.80	.....	.....
Copper*	.....	.....	46.00	.....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	.....	.....	46.00	.....

* Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25	5% Cr Hot Work	0.39
Extra Carbon	0.30	W-Cr Hot Work	0.41
Special Carbon	0.355	V-Cr Hot Work	0.42-.43
Oil Hardening	0.37-.390	Hi-Carbon-Cr	0.665-.70

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20	4	2	12	4	3.875
18	4	1	4.75	.....	2.180-2.320
18	4	2	9	.....	2.515
18	4	2	.....	.....	1.640
18	4	1	.....	.....	1.480
18	4	1	.....	.....	1.735
13.5	4	3	.....	.....	1.480
6	4.5	1.9	.....	5	1.005-1.055
6	4	3	.....	9	1.240
2	1.4	1.2	.....	.....	0.498
1.5	4	1	.....	8.5	0.895-0.895

Tool Steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V8.

PIG IRON

Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Alabama City, R2	52.38	52.88	.....	.....
Birmingham, R2	52.38	52.88	.....	.....
Birmingham, U6	.....	52.88	.....	.....
Woodward, Ala., W15	52.38	52.88	56.50†	.....
Cincinnati, del.	.....	60.43	.....	.....
Buffalo District				
Buffalo, R2, H1	56.00	56.50	57.00	.....
Tonawanda, N.Y., W12	56.00	56.50	57.00	.....
No. Tonawanda, N.Y., T9	.....	56.50	57.00	.....
Boston, del.	66.65	67.15	67.65	.....
Rochester, N.Y., del.	59.02	59.52	60.02	.....
Syracuse, N.Y., del.	60.12	60.62	61.12	.....
Chicago District				
Chicago, I-3	56.00	56.50	56.50	57.00
Gary, Ind., U5	56.00	.....	56.50	.....
Indiana Harbor, Ind., I-2	56.00	.....	56.50	.....
So. Chicago, Ill., W14, Y1	56.00	56.50	56.50	.....
So. Chicago, Ill., U5	56.00	.....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon, Mich., del.	.....	62.80	62.80	.....
Cleveland District				
Cleveland, A7	56.00	56.50	56.50	57.00
Cleveland, R2	56.00	56.50	56.50	.....
Akron, O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain, O., N3	56.00	.....	.....	57.00
Mid Atlantic District				
Bethlehem, Pa., B2	58.00	58.50	59.00	59.50
New York, del.	.....	62.28	62.78	.....
Newark, del.	61.02	61.52	62.02	62.52
Riegelsville, Pa., R10	58.00	58.50	.....	.....
Steelton, Pa., B2	58.00	58.50	59.00	59.50
Swedeland, Pa., A3	58.00	58.50	59.00	59.50
Philadelphia, del.	59.66	60.16	60.66	61.16
Troy, N.Y., R2	58.00	58.50	59.00	.....
Pittsburgh District				
Neville Island, Pa., P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, del.	57.37	57.87	57.87	58.37
McKees Rocks, del.	57.04	57.54	57.54	58.04
Lawrenceville, Homestead, Wilmerding, Monaca, del.	57.66	58.16	58.16	58.66
Verona, Trafford, del.	58.19	58.69	58.69	59.19
Brackenridge, del.	58.45	58.95	58.95	59.45
Bessemer, Pa., U5	56.00	.....	56.50	57.00
Clairton, Rankin, So. Duquesne, Pa., U5	56.00	.....	.....	.....
McKeesport, Pa., N3	56.00	.....	.....	57.00
Midland, Pa., C18	56.00	.....	.....	.....
Monessen, Pa., P7	56.00	.....	.....	.....

Youngstown District	Basic	No. 2 Foundry	Malleable	Bessemer
Hubbard, O., Y1	.....	.....	56.50	.....
Sharpsville, Pa., S6	56.00	56.50	56.50	57.00
Youngstown, Y1	.....	.....	56.50	57.00
Youngstown, U5	56.00	.....	.....	57.00
Mansfield, O., del.	60.90	.....	61.40	61.90
Duluth, I-3	56.00	56.50	56.50	57.00
Erie, Pa., I-3	56.00	56.50	56.50	57.00
Everett, Mass., E1	62.50	61.25	63.50	.....
Fontana, Calif., K1	62.00	62.50	.....	.....
Geneva, Utah, C11	56.00	56.50	.....	.....
Granite City, Ill., G4	57.90	58.40	58.90	.....
Ironton, Utah, C11	56.00	56.50	.....	.....
Lone Star, Texas, L6	52.00	52.50*	52.50	.....
Minnequa, Colo., C10	58.00	59.00	59.00	.....
Rockwood, Tenn., T3	.....	.....	56.50	.....
Toledo, O., I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	.....	.....

*Low phos, southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra, 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si, 75 cents for each 0.5% Mn over 1%)

Jackson, O., G2, J1	$67.00
Buffalo, H1	68.26

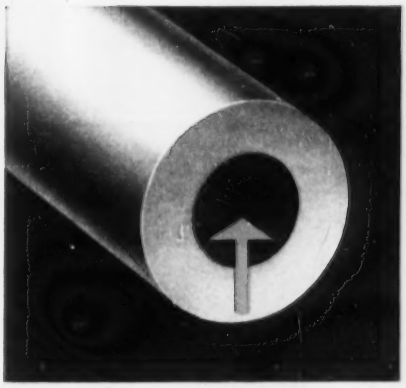
ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Niagara Falls, N.Y., P15	$87.50
Keokuk, Iowa, Openhearth & Fdry., freight allowed K2	92.00
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.00
Wenatchee, Wash., OH & Fdry., freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, Intermediate, A7	$61.00
Rockwood, Tenn., T3	70.00
Steelton, Pa., B2	64.00
Philadelphia, del.	64.00
Troy, N.Y., R2	64.00



a hole here makes waste...

a hole here makes a saving

Crucible Hollow Tool Steel Bars are a boon to the metalworking industry. The hole in these quality bars enable toolmakers to eliminate drilling, boring, cutting-off and rough-facing operations. This cuts production time, boosts machine capacity and saves scrap losses.

They are available now, in any of Crucible's famous tool steel grades, in almost any combination of O.D. and I.D. sizes. And you can get *immediate* delivery of five popular grades — KETOS oil-hardening, SANDERSON water-hardening, AIRDI 150 high carbon-high chromium, AIRKOOL air-hardening, and NU DIE V hot-work tool steels — from a conveniently located Crucible branch warehouse.

Let your Crucible representative show you how these steels can best help *you*.

Join your Civil Defence Team NOW!

CRUCIBLE first name in special purpose steels

54 years of Fine steelmaking **HOLLOW TOOL STEEL**

CRUCIBLE STEEL COMPANY OF AMERICA · TOOL STEEL SALES · SYRACUSE, N. Y.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Erie, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††		Carbon	Floor
Baltimore	6.29	7.64	7.78	7.00		6.86	8.17§	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00‡	6.30		6.15	8.90		6.35	6.35	8.25
Boston	6.80	7.83	9.18	7.13		6.87	8.36	12.13	7.06	7.13	8.26
Buffalo	6.18	7.15	8.70	6.79		6.53	7.70	12.02	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90		7.10	8.37		7.10	7.10	8.37
Chicago	6.18	7.12	7.95	6.42		6.28	7.30	11.60	6.46	6.33	7.46
Cincinnati	6.30	7.11	8.20	6.66		6.52	7.60	11.85	6.64	6.62	7.71
Cleveland	6.18	7.12	7.90	6.58		6.34	7.40	11.74	6.79	6.50	7.63
Detroit	6.28	7.29	8.22	6.69	7.36	6.56	7.60	11.97	6.91	6.80	7.80
Erie, Pa.	6.13		8.15	6.38		6.23	7.50§		6.50	6.36	7.79
Houston	7.15	7.60	9.25	7.45	9.30	7.45	9.30		7.35	7.20	8.55
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.10	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.12	6.59		6.43	7.57	11.77	6.63	6.50	7.63
Mobile, Ala.	6.65	7.47	8.35	6.77		6.63	7.65		6.81	6.68	
New York	6.78	7.52	8.37	7.16		7.06	8.43§	11.90	6.90	6.96	8.30
Norfolk, Va.	6.90			7.00		7.00	8.50		7.00	7.00	7.85
Philadelphia	6.35	7.13	7.87	7.02	8.80	6.87	8.15§	11.74	6.67	6.63	7.66**
Pittsburgh	6.18	7.12	8.00	6.55		6.28	7.65	11.60	6.46	6.33	7.46
Portland, Ore.	7.90	8.45	9.45	7.65		7.35	10.65		7.25	7.30	9.15
Richmond, Va.	6.50		8.67	7.10		7.05	8.20		7.10	6.85	8.20
St. Louis	6.48	7.42	8.25	6.72		6.58	7.70	11.90	6.86	6.73	7.86
St. Paul	6.51	7.25	8.06	7.09		6.91	8.06		7.12	6.96	8.12
San Francisco	7.35	8.70	9.30	7.60		7.15	9.75	12.90	7.25	7.20	9.25
Seattle	7.15	9.00	9.80	8.00		7.60	10.65	13.50	7.50	7.60	9.40
Spokane	7.15	9.00	9.80	7.60		7.60	10.55§	14.15	7.25	7.35	9.40
Wilmington	6.71	7.64	8.35	7.51		7.37	8.43		7.49	7.36	8.49

*Prices do not include gage extras. †Prices include gage and coating extras except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded). ‡Includes 3/4 cent special bar quality extra. §As rolled. ¶¼ in. and heavier; add 0.3¢ for 12 gage and lighter. **Has annealed. Bars quantities: 2000 to 9999 lb except as noted. Cold-rolled strip, and cold-finished bars: 2000 lb and over, except in Seattle where base is 2000 to 9999 lb. †† 500 to 1999 lb. ‡‡ 1000 to 1999 lb. §§ 1000 lb and over. ¶¶ 1500 lb. ## 2000 lb. *** Under 25 lb.

Warehouse Steel Demand Holds Steady

Numerous small-tonnage orders sustain turnover at about first-quarter volume. Price weakness is evident in some districts, but it fails to unsettle market

Cleveland. Warehouse order volume is disappointing but it is better than a month or two back and seasonal influences are expected to boost April bookings substantially.

First quarter volume of the warehouses over the country was under that of the like period a year ago. However, February business bettered that in January by 4 to 5 per cent, overall, and indications are March volume will be up from that of February.

Sheets and strip appear to be about the slowest moving items current by the warehouses at present. It is reported volume is off 35 to 40 per cent from a year ago. Plates and shapes, however, are moving at a good rate. February business in plates, shapes and bars was reported up 7 per cent from February, with cold-finished bars up 3 per cent.

New York. Warehouse distributors are working down inventories. Diversity of small orders helps. Volume has levelled off without much improvement over first quarter daily totals. Orders are largely for fill-in requirements.

Philadelphia. Warehouse business is fair, holding at about the March rate. Individual orders continue small, but are in sufficient number to sustain over-all volume.

Base prices of leading distributors are unchanged. There has been talk of possible revisions, but no action may be taken until sellers see what the truckers may do as regards rates now that eastern rail rates have been reduced. Softness in the warehouse market, however, continues to be reflected by the cutting of extras.

Chicago. Warehouse steel sales are holding fairly steady. Numerically, purchases and aggregate tonnage remain about the same as a month ago.

Pittsburgh. April sales promise to be slightly above March. Distributors report an increasing number of

STEEL IMPORT PRICES

(Rise per ton lb landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Reinforcing Bars, Intermediate, ASTM A 305	$1.55	$1.55	$1.50	$1.83
Bar Size Angles	4.40	4.40	4.55	4.98
Structural Angles	4.40	4.40	4.55	4.98
I-Beams	4.40	4.40	4.55	4.98
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, ¼ x 10"	5.50	5.50	5.45	5.78
Fairing Channels, C.F., 1000 lb, ¼ x 0.30 lb per ft	25.50	25.70	25.50	26.34
Barbed Wire	6.60	6.60	6.60	6.68
Merchant Bars	4.55	4.55	4.50	4.83
Hot Rolled Bands	4.70	4.70	4.65	4.98
Wire Rods, Thomas Commercial No. 5	4.77	4.84	4.82	5.09
Wire Rods, O.H. Cold Heading Quality No. 5	5.23	5.30	5.28	5.56
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

*Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling.

Size, O.D.	Wgt. Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.30/ft	2.17/ft	1.90/ft
Seamless N-80 Casing				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	26	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅜ in.	6.5	0.80/ft	0.83/ft	0.73/ft

*Source of shipment: Western continental European (Schuman Plan) countries.

inquiries, especially for plate and structural shapes. Volume of orders for tubular products and cold-finished bars is sufficient to hold prices.

San Francisco—Warehouse orders are about as numerous as they were a year ago but tonnage involved is smaller.

Seattle—The warehouse trade is hopeful of a good season although April volume has not increased as much as expected.

Cincinnati—Distributors' stocks are out of balance. Even structurals, one item recently in tight supply, are plentiful.

More Steel Poured in March

New York—Production of ingots and steel for castings in March totaled 7,290,000 net tons, reports the American Iron & Steel Institute. This was an increase of 206,763 tons from the February total of 7,083,237 tons. On a weekly basis, however, March output was under that of February, averaging 1,645,598 tons against 1,770,809 in the preceding month.

Output in first quarter this year amounted to 22,324,723 net tons, or 8.1 per cent higher than the average rate of production during the three years 1947-49.

The Institute states a year's output at the first quarter rate would result in production of more than 90 million net tons of steel. In only four years, it points out, has production exceeded 90 million tons. They were the four years 1950 to 1953, inclusive.

Comparative data are given in the accompanying table.

Slight Gain Noted in Sheet Bookings

Consumers ordering cautiously but some lines are taking a little more tonnage than in first quarter. Demand for galvanized sheets seasonally more active

Sheet and Strip Prices, Page 212 & 213

Boston—Flat-rolled specialties, including electrical, enameling and stainless, are slow with the buying pattern parallel to carbon sheet procurement. Orders are fill-in requirements for prompt delivery. Galvanized is showing seasonal improvement. All sheet volume is equalized as to freight with Fairless, Pa. lowest base on carbon grades.

An outstanding cold strip inquiry includes 450 tons of cartridge clip steel, Springfield Arsenal, bids closing Apr. 30 on 350 tons, WD-1015 special, .033 — .002-inch, 3¾ inch wide.

New York—Although sheet operations are far below capacity, orders show mild improvement. This is especially true in cold sheets, with more going into household appliances and electrical equipment.

Philadelphia—Slightly swelling volume of automotive work is bolstering sheet demand here. Also reflected are an improved, though disappointing, volume of specifications from agricultural equipment builders, and seasonal upswing in air-conditioning needs.

Pittsburgh—Sheet and strip sales are in short term doldrums. Some price weakness is reported by warehouses. Competition for small orders causes mills and warehouses to speed service where possible.

Cleveland—Order volume in sheets and strip is not what producers would like and can handle, but it is holding up much better than demand for some other products, notably bars. Actually, demand for the flat-rolled items continues to provide the major support to steel operations, curtailment of which is due more to the slack in requirements of other products.

Effective Apr. 8, a revised list of extras on silicon sheets and coiled silicon strip was issued by Republic Steel Corp. The new list supersedes one dated May 18, 1953, and includes changes in the silicon gage table, dimensional extras, deoxidizing and width tolerances.

Cincinnati—Warehouse stocks of sheets are plentiful. Competition is keen with distressed stocks being offered.

Detroit—Sheet sales show moderate gains. Still hoped-for is a marked upturn toward end of this month, carrying through the heavy auto buying season just begun.

Chicago—Demand for galvanized sheets outruns that for any other flat-rolled product relatively speaking.

St. Louis—Cold-rolled sheet orders are climbing slowly. Mills are confident April bookings will better March volume, which in turn was better than that in February.

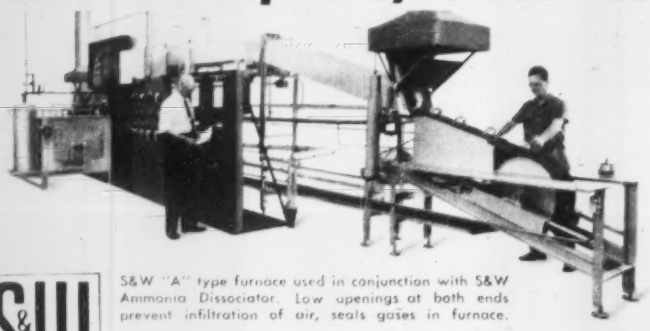
Period	OPEN HEARTH Net tons	Per cent of capacity	Index	BESSEMER Net tons	Per cent of capacity	Index	ELECTRIC Net tons	Per cent of capacity	Index	TOTAL Net tons	Per cent of capacity	Index	Calculated weekly production (Net tons)	Number of weeks in month
1954														
January	7,250,326	78.2	115.3	260,453	61.0	74.1	134,567	48.9	121.7	7,951,186	75.3	111.8	1,794,918	4.43
February	6,523,213	77.9	112.8	174,258	47.4	54.9	104,751	48.1	119.6	7,063,222	74.1	110.2	1,770,909	4.00
March	6,851,000	71.8	102.9	205,000	51.1	59.2	129,000	45.5	126.1	7,290,000	69.0	102.4	1,645,598	4.43
1st Qtr.	20,132,539	74.8	109.9	639,711	54.4	63.0	368,318	47.5	120.4	22,324,723	72.3	106.1	1,734,992	12.86
1953														
January	8,841,679	101.4	138.0	350,200	88.9	99.7	206,863	81.2	197.7	9,897,962	99.1	139.1	2,234,303	4.43
February	7,939,260	100.8	137.2	329,389	92.6	103.8	164,091	84.6	205.9	8,932,778	99.1	139.0	2,233,195	4.00
March	9,050,773	103.7	141.3	354,710	99.0	101.0	762,814	87.7	213.5	10,168,098	101.8	142.9	2,295,282	4.43
1st Qtr.	25,831,751	102.0	138.9	1,034,299	90.4	101.4	2,132,788	84.5	205.7	28,998,839	100.0	140.4	2,254,964	12.86
April	8,493,909	100.5	137.0	334,605	87.7	98.4	717,024	83.2	207.4	9,545,538	98.7	138.7	2,225,067	4.29
May	8,923,163	102.3	139.3	354,577	90.0	100.9	717,340	82.5	200.8	9,995,080	100.1	140.5	2,256,677	4.43
June	8,594,502	99.1	135.4	332,060	87.6	97.7	677,917	80.6	196.1	9,404,479	97.2	136.6	2,192,186	4.29
2nd Qtr.	25,813,574	100.8	137.3	1,021,242	88.3	99.0	2,112,281	82.7	201.5	28,947,097	98.7	138.6	2,224,988	13.01
1st 6 mos.	51,645,325	101.4	138.1	2,055,541	89.3	100.2	4,245,070	83.6	203.6	57,945,936	99.4	139.5	2,239,889	25.87
July	8,316,342	95.5	129.8	324,068	82.4	92.2	655,263	73.2	177.9	9,275,673	93.1	130.4	2,088,569	4.42
August	8,463,155	97.0	132.1	319,074	78.7	88.2	632,351	72.7	177.0	9,406,580	94.2	132.2	2,123,156	4.43
September	8,076,277	95.8	130.3	287,638	75.6	84.6	519,513	64.9	159.3	8,883,428	92.1	129.9	2,075,567	4.28
3rd Qtr.	24,855,774	96.1	130.8	921,780	78.9	88.4	1,747,127	69.4	168.6	27,564,681	93.1	130.6	2,099,366	13.13
9 mos.	76,501,099	99.6	135.6	2,977,321	85.8	96.2	5,992,197	77.8	191.5	85,510,617	97.3	136.5	2,192,580	39.00
October	8,643,428	99.1	135.0	325,250	82.6	92.6	489,044	56.3	136.9	9,462,722	94.7	133.0	2,136,966	4.43
November	7,902,519	94.7	129.1	283,321	74.1	83.3	494,352	48.0	117.0	8,680,052	89.9	126.2	2,025,653	4.29
December	7,321,917	84.1	114.5	269,813	68.6	76.8	554,568	49.9	99.3	7,946,328	79.7	111.7	1,797,812	4.42
4th Qtr.	23,972,224	92.6	126.1	878,384	74.2	84.2	1,247,964	48.4	117.7	26,089,102	88.1	123.6	1,986,233	13.14
12 mos.	100,473,323	97.9	133.2	3,855,705	83.2	93.2	7,240,161	71.1	173.1	111,609,719	94.9	133.2	2,110,578	52.14

Note: The percentages of capacity operated are calculated on weekly capacities in 1954 of 2,092,342 net tons open hearth, 31,419 net tons bessemer and 200,257 net tons electric ingots and steel for castings, total 2,324,549 net tons, based on annual capacities as of Jan. 1, 1954 as follows: Open hearth 109,084,750 net tons, bessemer 1,787,000 net tons, electric 10,448,600 net tons, total 124,339,419 net tons.

Note: The percentages of capacity operated are calculated on weekly capacities in 1953 of 1,969,275 net tons open hearth, 39,934 net tons bessemer and 406,240 net tons electric ingots and steel for castings, total 2,254,455 net tons, based on annual capacities as of Jan. 1, 1953 as follows: Open hearth 102,677,980 net tons, bessemer 4,637,000 net tons, electric 10,232,490 net tons, total 117,547,470 net tons.

*Revised. †Preliminary figures, subject to revision. ‡Index of production based on average annual production of the three years 1947-1948-1949.

Less *atmosphere*, lower cost



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NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture.

Plates . . .

Plate Prices, Page 212

Pittsburgh With large inventories and promise of quick delivery, demand holds level at a good rate from warehouses and fabricators. Sales are even with last month.

Boston Plate mills have to dig to fill April schedules, although demand for lighter gages shows a slight gain. Small tanks, notably for fuel storage at airports, account for a slight increase in backlogs with one or two shops.

New York Inquiry from the oil and chemical industries is doing much to bolster the meager activity in plates. Oil refinery building and modernization are accounting for substantial tonnage.

Philadelphia Plate demand lacks buoyancy. It is getting no worse, but it reflects little gain. Lead-time is usually 10 days to two weeks.

Seattle Plate fabricators report large projects lacking. However, there is some interest being shown in small water storage tanks, running to under 100 tons each.

Steel Bars . . .

Bar Prices, Page 212

New York Hot bar sellers can still book tonnage for April rolling. However, this reflects no easier situation than a month ago and sellers report business is holding its own, and, perhaps is a little better. March showed a mild uptrend in new orders and some sellers insist this will prove the case in April. Cold drawers are taking in a little more tonnage as a result of some gain in sales, and more tonnage being specified for construction and maintenance.

Chicago Inland Steel Co. issued a revised list of extras on rail steel bars, shapes and bands effective Apr. 5. The revisions include some reductions in length and cutting extras and two changes in size extras for plain rounds.

Boston Bar users are placing more orders for small sizes but individual lots are under the normal average. Consumers show no disposition to build inventories in view of current prompt shipments.

Pittsburgh Cold-finished bar sales, in some cases, are running ahead of last year's totals in the number of incoming orders. Individual orders are for small quantities. Outlook for April is for a slight increase over March sales.

Cleveland Barmakers continue to find the going rough although here and there some slight pickup in de-

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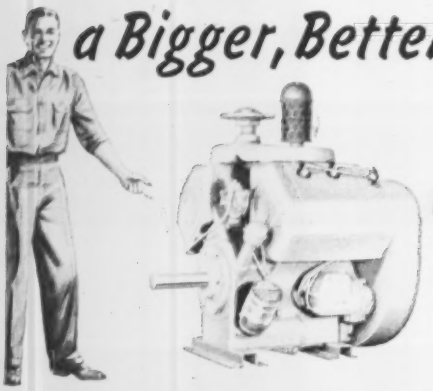

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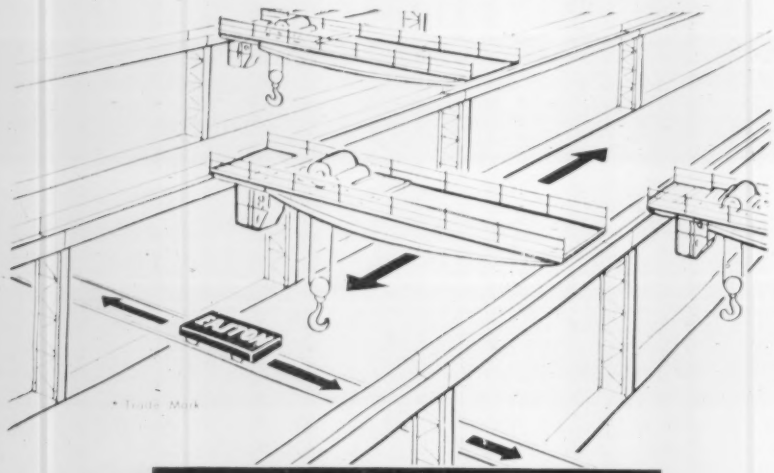

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mand is reported. In the main, however, consumers still are depending on inventories.

Philadelphia Hot-rolled carbon bar shipments this month should show a small edge over March.

The Navy procurement office here is inquiring for 235 tons of nickel-molybdenum alloy reforging material and 165 tons of free-cutting bars, the latter for Raritan Arsenal, New Jersey; also 100 tons of cold-finished screw stock.

Cincinnati There are no supply shortages in carbon and alloy bars. Business continues much the same with a few sellers reporting a slight pickup.

Tubular Goods . . .

Tubular Goods Prices, Page 215

Boston On limited orders for direct shipment, notably seamless for utilities, earliest shipment frequently is the decisive factor. Mills are equalizing on seamless, but none are suffering too much with production and basing largely in Mid-west or Pittsburgh. Seamless price averages out to around $2 over lapweld produced in smaller sizes in East.

Merchant pipe sales of distributors are up slightly, but mill tonnage is held to replacement needs.

New York As building operations expand commercial pipe inquiry improves. Resellers' prices are unsettled. Direct demand from public utilities is steady.

Philadelphia Merchant pipe business is in a seasonal upswing, following the trend in building activity. Resellers' prices, however, have stiffened little.

Pittsburgh Tubemakers report reduced operations. Welded tube producers report consumer inventories so low immediate delivery is required. Seamless tube sales are dull.

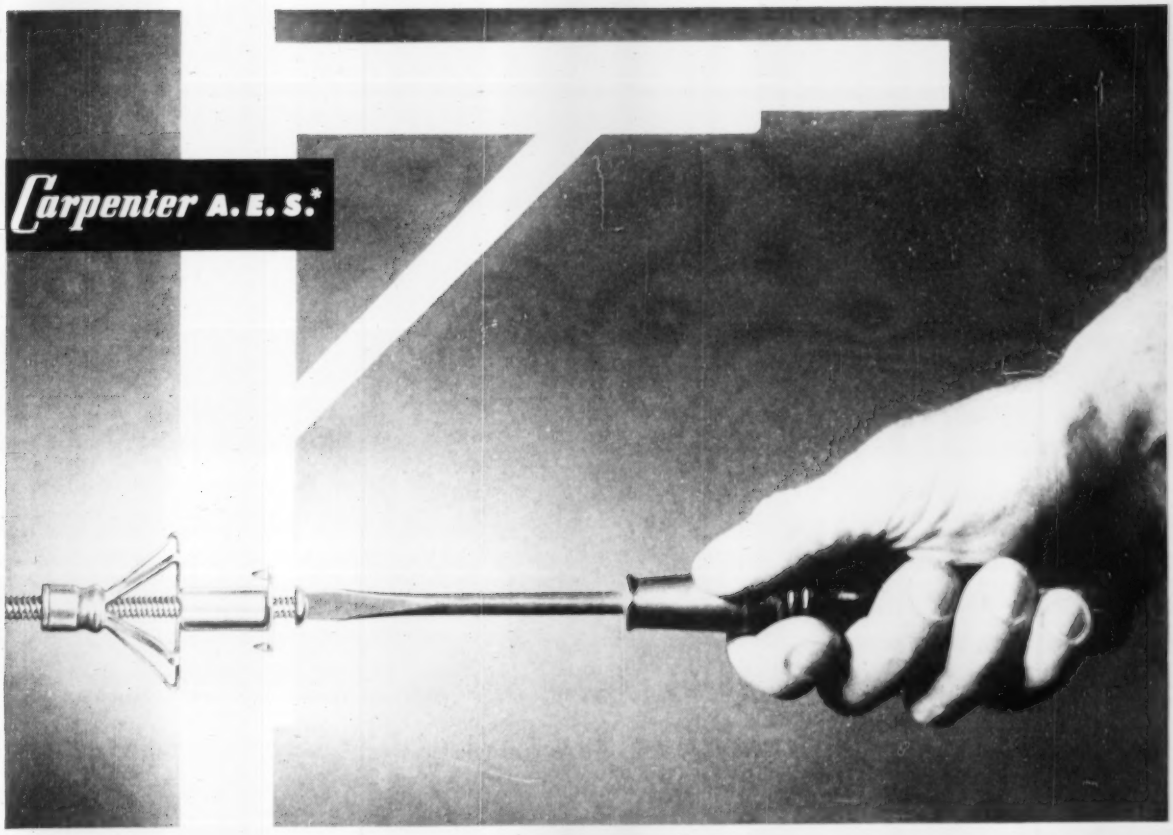
Chicago Sales of light and medium tubular products have improved steadily during the past month and sales currently are not too far below volume during the comparable period last year.

St. Louis Pipe demand remains strong in sizes up to 4 inches. April order books are reported filled.

Los Angeles Australian pipe is on the market in quantity.

Pacific Tube Co. installed a 150,000-pound draw-bench, said to be the largest in the Far West, to draw tubing up to 6½ inches in diameter and 51 feet in length.

Seattle Considerable activity in less-than-carload lots is noted as cities seek to cover cast iron pipe requirements to improvements to municipal systems and for inventory.



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BROWN INSTRUMENTS

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Wire . . .

Wire Prices, Page 214

Chicago—Merchant wire products are moving well following the usual seasonal pattern. However, jobbers display a reticence to enlarge stocks. Ability of mills to ship quickly apparently prompts jobbers to maintain inventories at barest minimum.

Boston—Slight increase in diversification of wire demand is accompanied by some seasonal improvement in merchant products, including highway cable and fencing.

New York—Sluggish recovery in wire buying is attributed to inventory and consumption. Both are lower and orders are small for prompt delivery.

Philadelphia—Modest gain in wire demand is reflected principally in the merchant products. Little change is noted in movement of manufacturers items.

Pittsburgh—Seasonal increases continue in merchant products such as chain link fence, barbed wire and nails. Other wire sales show no improvement.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 212

Los Angeles—In the face of lessened demand for reinforcing bars, local barmakers are aroused over imports of Japanese material at San Diego for re-shipment to Mexico.

Pig Iron . . .

Pig Iron Prices, Page 216

Buffalo—While pig iron buying is sustained among building equipment casters, the general merchant pig iron market remains spotty. Automotive demand is fair. General foundries, however, continue to operate on curtailed basis.

Cleveland—Spotty foundry operations and availability of tonnage for quick shipment make for continued sluggish movement of merchant iron.

New York—Pig iron business is lagging. Sellers note little change in volume. Gray iron shops are operating three to four days a week. Steel and malleable casting plants are doing a little better, but as compared with their own operations a few weeks ago, are showing little pickup.

Cincinnati—Sales remain on the slow side. Pig iron prices remain firm. Foundries on agricultural implement work note a pickup.

Philadelphia—While four blast furnaces in the eastern Pennsylvania area suspended operation this past

(Please turn to page 231)

how DE-STA-CO makes specialties S.O.P.*

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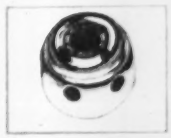

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CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (20-21% Mn, 1-3% Si) Carlot per gross ton, $56, Palmerton, Pa.; $57 Clairton and Duquesne, Pa.

(16 to 19% Mn) $51 per ton, Palmerton, Pa.; $55 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% max.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala., and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $205 per net ton, f.o.b. Artonda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low Carbon Ferromanganese, Regular Grade: (Mn 85-90%, Carload, lump, bulk max. 0.07% C 24.5c per lb of contained Mn, carload packed 28.2c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.3c for max. 0.15% C grade from above prices. In for max. 0.30% C 1.5c for max 0.50% C, and 4.5c for max 7.0% C max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.06c to the above prices. Spot, add 0.25c.

Medium Carbon Ferromanganese: (Mn 80-85, C 1.0% max) Carload, lump, bulk 21.3c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 99.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 38.2c per lb of metal, packed, 39.5c, ton lot 42.4c, less ton lots 49.4c. Delivered. Spot, add 2c.

Electromanganese: Min. carloads 36c; 2000 lb to min. carloads 32c; 250 lb to 1999 lb 34c; less than 250 lb, 37c. Premium for hydrogen retorted metal, 1½c per lb, f.o.b. cars, Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-85%) Contract, lump, bulk, 1.50% C grade 18.20c, Si 11.00c per lb of alloy, carload packed, 11.7c, ton lots 12.6c, less ton 13.6c. Freight allowed. For 2% C grade, Si 16-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low Carbon: (Ti 20-25%, Al 4.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.40 per lb of contained Ti, less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High Carbon: (Ti 15-18%, C 6.5% max). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium Carbon: (Ti 17-21%, C 2.5% max). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High Carbon Ferrochrome: Contract, c.l. lump, bulk 24.5c per lb of contained Cr, c.l. packed 25.6c, ton lot 26.8c, less ton 28.2c. Delivered. Spot, add 0.25c.

Low Carbon Ferrochrome: (Cr 62-72%) Contract, carload, lump, bulk, max. 0.02% C (Simplex) 34.0c per lb contained Cr, 0.06% C 36.5c, 0.1% C 35.5c, 0.20% C 34.5c, 0.10% C 31.0c, 0.15% C 33.2c, 0.20% C 32.5c, 0.50% C 32.2c, 1.0% C 31.0c, 1.50% C 32.8c, 2% C 32.2c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 4-6%) Contract, c.l. M & D, bulk, 26.2c, per lb contained Cr. Packed, c.l. 27.5c, ton 28.9c, less ton 30.2c. Delivered Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 58-64%, Si 28-32%, C 1.25% max). Contract carload, packed, S. M. x D, 18.3c per lb of alloy, ton lot 19.2c, less ton lot, 20.4c, delivered, spot, add 0.25c.

Low Carbon Ferrochrome Silicon: (Cr 31-41%, Si 12-40%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 10.5c per pound of contained silicon; 1" x down, bulk 25.25c per pound of contained chromium plus 11c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D, packed, max 0.50% carload $1.12, ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-5.5% max, C 0.5-1% max) $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 66c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c, ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 10.80c per lb of contained Si, carload packed 12.0c, ton lot 13.50c, less ton 14.90c. Delivered. Spot, add 0.45c.

Low Aluminum 50% Ferrosilicon: (Al 0.40% max) Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 12.2c per pound contained silicon, carload packed 13.50c, ton lots 14.75c, less ton, 16.1c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 15.1c, ton lot 16.2c, less ton 17.50c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe, C 1% max) lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.2c per lb of alloy, ton lots packed 10.1c, 200 to 2000 lb 10.9c, less ton lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15% Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.7c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.2c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.2c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.2c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, ton lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20, Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si) $5.25 per lb contained B, delivered to destination.

Bortam: (B 1 to 1.9%). Ton lots, 45c per lb, smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) Contract, lump, carloads 9.5c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3.5%) Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.65c, ton 17.75c, less ton 18.6sc. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size, weighing approx. 3 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.3c per lb of briquet. Packed c.l. 7.10c, ton lot 7.9c, less ton 8.8c. Delivered. Spot, add 0.25c.

(Small size, Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.4c. Packed c.l. 7.25c, ton lot 8.40c, less ton 8.8c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic Oxide Briquets: (Containing 2% lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%) 5000 lb W or more, $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02. f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max) Contract, ton lot, 2" x D, $9.50 per lb of contained Cb, less ton $9.55. Delivered. Spot, add 10c.

Ferrotantalum-Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 5-7%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 4.3c per lb of alloy, ton lot 4.7c, less ton 5c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, 1" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.3c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.5c per lb of alloy; ton lots 18.50c, less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-3 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 9-11%, C 1%) packed 16.6c per lb of alloy, ton lots 18.1c, less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al, bal Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.45c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41, Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic Oxide: Per lb. contained Mo, f.o.b. Langeloth, Pa., $1.14 lb cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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This idea belongs in your plant, not in your files. Because, the sooner YALE equipment goes to work for *you*, the sooner it will increase efficiency, economy and safety in every phase of your operation.

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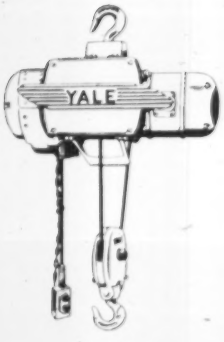

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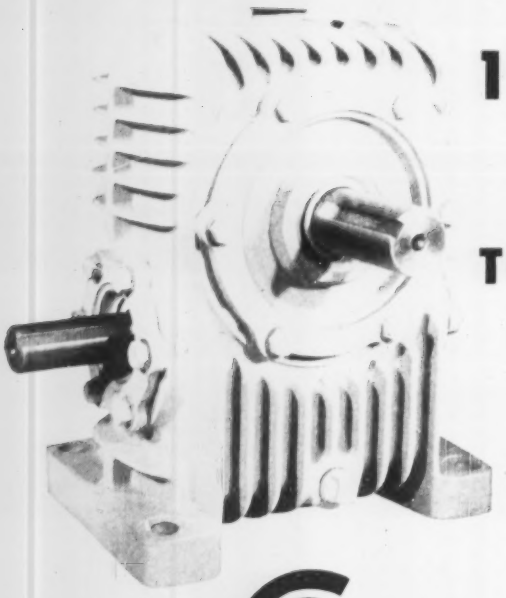

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Ratios from 5:1 to 4900:1.
Loads from fractional to 800 HP.
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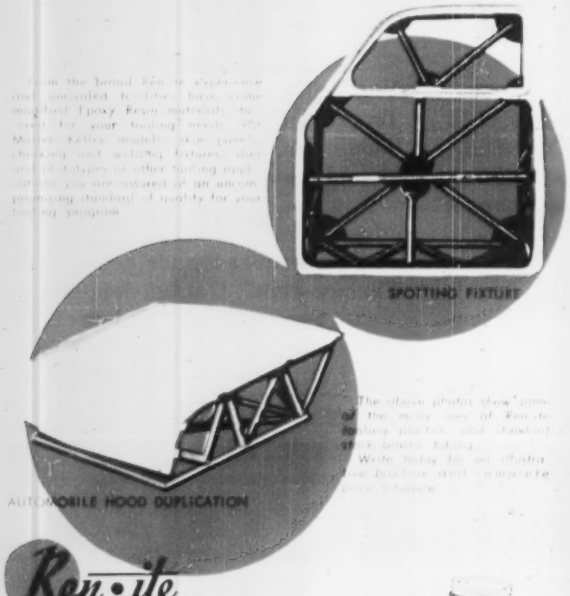
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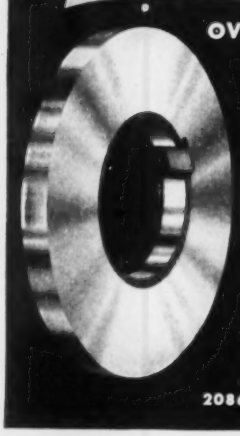

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COWLES TOOL COMPANY
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ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
North African hematite (spot)	20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	17.00-17.50
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, $1.02-$1.05 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, $0.95-$0.97.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$24.00-$26.00
48% no ratio	34.00

Domestic
(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb Mo content mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb V_2O_5 content, deld mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° F: Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O. $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent*: Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-$15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld	*26.00
Chicago, ovens	24.50
Chicago, deld	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld	28.12
Cincinnati, deld	25.85
Painesville, O., ovens	25.50
Cleveland, deld	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	25.95
Neville Isl., Pa., ovens	25.00
St. Louis, ovens	
St. Louis deld	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld	26.62
Detroit, ovens	25.50
Detroit, deld	26.50
Buffalo, deld	28.08
Flint, deld	28.23
Pontiac, deld	27.06
Saginaw, deld	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$44-$47
Birmingham area	45.00†

†With port equalization against imports

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

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Imported, net ton, duty paid, metallurgical grade, $35-$36.

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Inches Diam	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.60
24	72, 84	9.10
20	60	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

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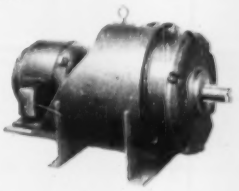

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- ★ Will not "flat" or dig into surfaces.
- ★ Hits selected areas to remove as much or as little stock as needed.
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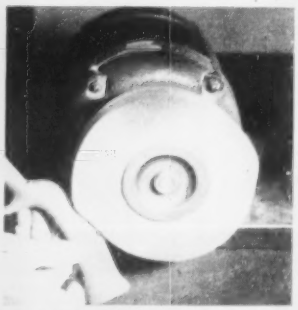

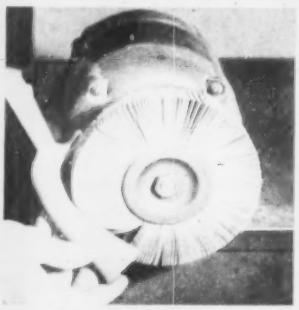

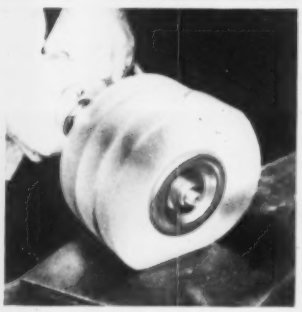

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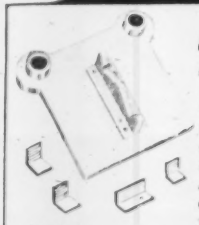
Punches and Dies



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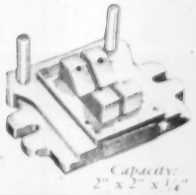

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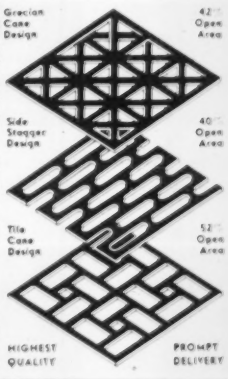

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(Concluded from page 225)

week, one stack at Swedeland, Pa., and three at Steelton, Pa., producers have enough iron on hand to meet customers' requirements for the period of furnace suspension.

Chicago Spotty conditions prevail in foundries but prospect is that pig iron purchases in April will at least equal, perhaps exceed, those in March.

Rails, Cars . . .

Track Material Prices, Page 215

New York Freight car order backlogs amounted to 20,966 cars at beginning of this month, compared with 25,411 on Mar. 1. Domestic car orders last month totaled 318, with 251 going to commercial shops and 97 to railroad shops. Major order involved 235 tank cars.

March deliveries numbered 1823 cars, against 3971 in February, and 6679 in March, 1953.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 229

Cleveland Spotty foundry operations are reflected in continued sluggish movement of oven coke. Day-to-day requirements vary from shop to shop and supplies are adequate to meet demands promptly.

Philadelphia The Swedeland, Pa. producer has reduced its price on oven foundry coke 85 cents per ton to 823 ovens.

Chicago Sales of foundry coke in April likely will top March business by a narrow margin but the situation still is touch and go.

Structural Shapes . . .

Structural Shape Prices, Page 212

Philadelphia Structural inquiry is expanding moderately, especially for bridgework and schools. A number of schools are now either active or in the late planning stages. These projects average about 100 tons each.

Boston Structural shops are holding plain material orders to fill-in tonnage on which they want prompt shipment. Fabricated steel prices are subject to sharp competition, although, in most cases, shops hold about three months backlog.

New York Bridge work is expanding and promises to play a leading role in construction activity. There is an increasing diversity of building construction, including school work on Long Island and in northern New Jersey. Competition among fabricators is keen.

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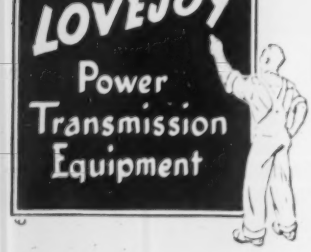

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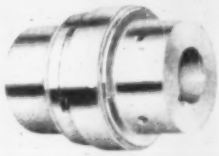

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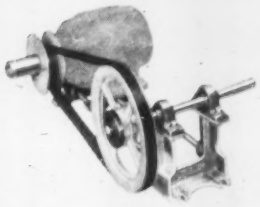

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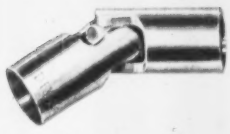

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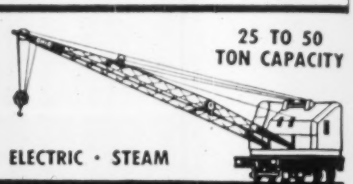

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panies can obtain full requirements of shapes. Delivery of some light beams is slow.

Tool Steel . . .

Tool Steel Prices, Page 216

New York Shipments of high speed and tool steel (excluding hollow drill steel) totaled 7431 net tons in February, reports the American Iron & Steel Institute. This was a decline compared with shipments of 8117 tons in January, and was off sharply from the 10,046 tons shipped in February a year ago.

In the first two months this year shipments amounted to 15,548 net tons, comparing with 19,815 tons in the like period of 1953, 28,016 tons in the corresponding period of 1952 and 26,127 tons in the first two months of 1951.

February shipments consisted of 1163 tons of Class A high speed steel against 1272 tons the preceding month; 232 tons of Class B high speed steel against 269 in January; and 6163 tons other tool steels against 6683 in the preceding month.

Pittsburgh Inventory adjustment which has depressed sales this year may be nearly completed, producers say.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2500 tons, apartment, Lower Fifth Ave., on site of old Brevort Hotel, New York, for Minskoff & Son, to Bethlehem Steel Co., Bethlehem, Pa.

650 tons, state highway bridge, Charlemont, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Daniel O'Connell's Sons Co., Holyoke, Mass., general contractor.

225 tons, 4 span slab bridge on I-beams, Nashua, N. H., to Phoenix Bridge Co., Phoenixville, Pa.; E. D. Swett, Winchester, N. H., general contractor; also 100 tons reinforcing and bearing piles to be placed.

200 tons, stringer bridges, Brockton section, Fall River, Mass., expressway, to Phoenix Bridge Co., Phoenixville, Pa.; D. V. Frione & Sgb, New Haven, Conn., general contractor.

190 tons, building, Insurance Co. of North America, Philadelphia, to Frank M. Weaver Co., that city.

180 tons, frame and welded plate girder bridge, Pennichuck Brook, Nashua, Merrimack, N. H., to Phoenix Bridge Co., Phoenixville, Pa.; R. G. Watkins & Son, Inc., Amesbury, Mass., general contractor; also 60 tons steel bearing piles to be placed.

100 tons, parish school, Seattle area, and miscellaneous, to Pacific Car & Foundry Co., Seattle.

100 tons, bridge, Alaska Road Commission, to Isaacson Iron Works, Seattle.

STRUCTURAL STEEL PENDING

2000 tons, bridge work, state highway, Monroe county, New York, Lane Construction Corp., Meriden, Conn., low on general contract.

2000 tons, cantilever hangar, airfield base, Portsmouth, N. H., Arthur Venneri Co., Westfield, N. J., low.

1000 tons, A & P store, Yeadon, Pa., John A. Robbins, general contractor, Philadelphia.

900 tons, barracks and structures, airfield base, Portsmouth, N. H.; bids Apr. 23.

865 tons, bridges and subway, Cook and Clark counties, Illinois, State Division of Highways, Springfield, Ill.; Bethlehem Steel Co., Bethlehem, Pa., low.

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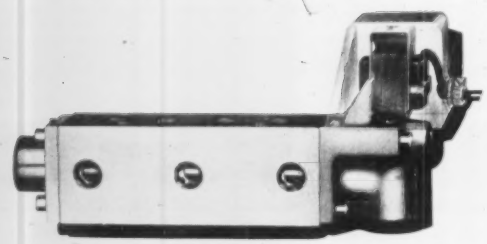

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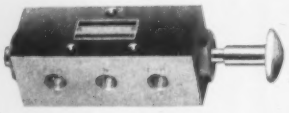

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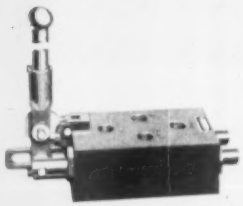

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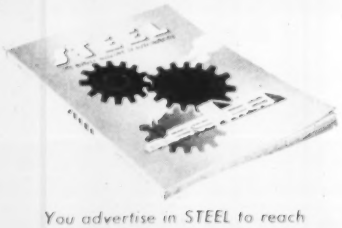

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500 tons, secondary school, Clearfield, Pa., bids Apr. 29.
500 tons, three buildings, Dow Airfield Base, Bangor, Me.
475 tons, grade separations and bridge, Kankakee and McHenry counties, Illinois, State Division of Highways, Springfield, Ill.; Vincennes Steel Corp., Vincennes, Ind., low.
208 tons, state bridge work, Bucks county, Pennsylvania, bids Apr. 23.
200 tons, addition, Coalton, Ky., school, Wilkes-Barre, Pa., bids asked.
500 tons, Supply Department, Puget Sound shipyard, Bremerton, Wash., bids Apr. 21.
275 tons, bridge, Jackson county, Illinois, State Division of Highways, Springfield, Ill.; American Bridge Division, U. S. Steel Corp., Pittsburgh, low.
200 tons, trash racks, Palisades dam, Idaho, Herrick Iron Works, Oakland, Calif., low, $55,100 to Bureau of Reclamation, Denver.
142 tons, state bridge work, Susquehanna county, Pennsylvania, bids May 7.
162 tons, state bridge work, Tioga county, Pennsylvania, bids Apr. 30.
100 tons, gate hoists, Palisades dam, Idaho, C. F. Stewart Machine Co., Birmingham, low, $22,517, to Bureau of Reclamation, Denver.

REINFORCING BARS . . .

REINFORCING BARS PLACED

450 tons, Ladd Air Base dormitories, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Grove Shepherd, Wilson & Kluge, Seattle, general contractors, $1,196,083.
180 tons, grain elevator, Wilson Creek, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

500 tons, also 113 tons shapes and sheetpiling, Idaho state road and bridge, Peter Kiewit Sons' Co. and LeBeau Tompkins Co., Lawton, Wash., low, bid for $1,122,532.
500 tons, transmission tower foundations, Big Bend dam site, Fort Pierre, S. Dak., Morrison-Knudsen Co., Inc., Boise, Idaho, low bids Apr. 22, Bureau of Reclamation, Denver; contract also includes erection of 11,000 tons of steel towers.
115 tons, bridge parts and abutments, Maine turnpike extension between Falmouth and Gray, Me., bids in Augusta, Me.; contract also for erection of 715 tons structural steel for 9 bridges.
250 tons, also miscellaneous steel, 70 mile laterals, Columbia Basin project, bids to Bureau of Reclamation, Denver, within 30 days.
115 tons, 271 concrete bridge, Bass county, Illinois, bids to Bureau of Public Roads, Apr. 22.

PLATES . . .

PLATES PLACED

300 tons, three elevated water storage tanks, Bergen Township, Mich., to Pittsburgh Des Moines Steel Co., Pittsburgh, $149,700.

PLATES PENDING

24 tons, tool plates, Navy general stores office, Philadelphia, bids Apr. 21.

PIPE . . .

CAST IRON PIPE PLACED

400 tons, 4 and 6 inch, Pacific Northwest, Iron Pipe Co., Provo, Utah, to Coastal Pipe Co., Portland, Ore.

CAST IRON PIPE PENDING

700 tons, 12 inch, 1,000 feet standard, 6 inch, 700 feet standard, bids to Seattle, Wash., Everett, Wash., Apr. 12.
161 tons, bids at Omak, Wash., Apr. 16.

RAILS, CARS . . .

RAILROAD CARS PLACED

Texas & Pacific, 200 hopper steel box cars and 75 steel caboose cabins, to The Texas Marshall, Tex., shops for delivery in Dec.

RAILROAD CARS PENDING

Army Transportation Corps, Marietta, Pa., 825 steel box cars, 500 gondolas, and 50 hopper cars, bids Apr. 28.
American Railway Express, 300 express refrigerator cars, bids asked.

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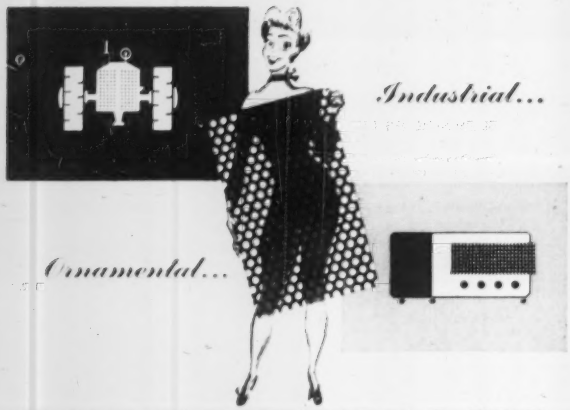

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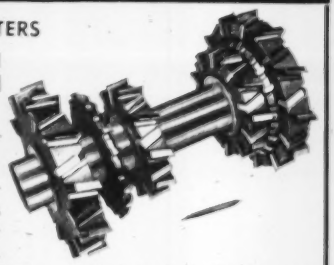

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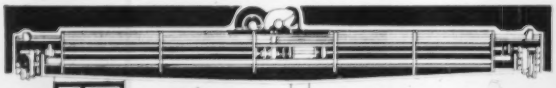

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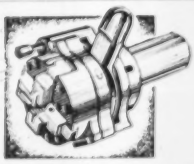

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Dealer Scrap Stronger Though Sales Lag

Market sentiment definitely improved at some consuming centers despite curtailed steelmaking operations and absence of active buying. Lower prices resisted

Scrap Prices, Page 208

Chicago—Stronger tone is noted in scrap despite the fact steelmaking operations are only 74.5 per cent of capacity, mill inventories are generous and, except for No. 2 heavy melting steel, supply exceeds demand. A few consumer purchases are up $1 to $2 a ton. Much of the flurry, however, is in dealer-broker transactions with reported prices $2 above what consumers are understood to have paid for limited tonnages. There is new strength in most cast grades.

New York—Trading in steel scrap is quiet, with brokers' buying prices nominally unchanged. Domestic steel scrap consumers are doing only token buying.

There is some foreign consumer interest but little tonnage is being purchased at present. Inquiry is out from Yugoslavia and Argentina. Japan is dickering, but is being handicapped by a shortage of dollars. Last fall Japan came into the United States market for 150,000 tons and up to now has covered on approximately 125,000 tons, it is estimated. Within the past few weeks three cargoes left the eastern seaboard for Japan, possibly with a total of 22,000 tons.

Despite dullness, the trade feeling here is better with the general belief prevailing the market is at bottom.

Boston—Steel scrap volume has dropped 75 per cent from early second quarter last year and, while the decline in prices has been stemmed, recovery is hampered by continued lack of buying. Turnings are a trifle firmer in the short shoveling classification. Cast scrap trading is in small lots, mostly by truck at unchanged prices. Best dealers will pay for unprepared steel scrap is $7 to $8 per ton, and they are reluctant to pay that with inventories of prepared scrap high.

Cleveland—Sentiment continues to improve in the scrap market although quantity sales of dealer material are absent. Some buying of production scrap by a Valley mill is reported, and rumors circulating last week were to the effect a large mill was about to place substantial orders which would include dealer grades. As a result of the improved sentiment prices on steel grades are quoted up $1 per ton by some sellers who report brokers meeting difficulty obtaining tonnage at lower levels.

Pittsburgh—Lower steel operating rates cause continued dullness in the scrap market. Stainless scrap prices are weaker. Only two mills are reported purchasers this month. Scrap dealers resist a further drop in prices.

Buffalo—Dealers are reluctant to accept additional orders at the current level of prices. The entire market shows steadier tendencies. Sustained buying by Canadian sources continues to absorb available cast supplies. Dealers, however, are restraining optimism because of the lagging ingot rate.

Philadelphia—The steel scrap market continues at a stalemate. There is, however, a slightly more optimistic tone, apparently based on more active trading in other districts. Locally, cast scrap grades and certain railroad specialties are in best demand.

Cincinnati—Open hearth and cast scrap moved up strongly in the local market. Steel mill purchases pushed open hearth grades up $1 a ton. Price changes on cast ranged from $1 to $2 a ton. Out-of-town transactions lifted mixed borings and turnings and cast iron borings 50 cents to $1 a ton. No. 1 railroad heavy melting climbed $2 a ton.

Detroit—Scrap is holding the slight increases registered a week ago with a pickup in No. 2 grades current. Substantial portions of sales volume are going to other districts like Chicago and Pittsburgh. Mill purchases here are sluggish.

St. Louis—Scrap prices have firmed moderately. Dealers are not pushing offers with the mills holding supplies sufficient for 60 to 75 days at the current rate of operations. Railroad scrap offerings are substantial, except for rerollers which are in noticeably short supply. Cast scrap demand is spotty.

Los Angeles—Mill buying of steelworks scrap is increasing but is limited to No. 1 bundles at prices off $2 to $11. Foundries have sufficient supplies of cast for 2 months' production.

San Francisco—Steel scrap collections are discouraged by the prevailing prices. Little tonnage is being accumulated. Mill inventories are de-

(Please turn to page 210)

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IRON AND STEEL SCRAP

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

April 15	$25.37
Apr. 8	25.32
Mar. Avg.	24.37
Apr. 1952	42.88
Apr. 1949	24.06

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plants)

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	26.00-27.00
No. 2 bundles	22.00-23.00
No. 1 busheling	26.00-27.00
Machine shop turnings	14.00-15.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	14.00-15.00
Cast iron borings	17.00-18.00
Cut structurals	27.00-28.00
Heavy turnings	26.00-27.00
Punchings & plate scrap	26.00-28.00
Electric furnace bundles	25.00-26.00

Cast Iron Grades

No. 1 cupola	31.00-32.00
Charging box cast	31.00-32.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	28.00-29.00
R.R. malleable	41.00-42.00
Rails, 2 ft and under	43.00-44.00
Rails, random lengths	38.00-39.00
R.R. steel specialties	43.00-44.00

Stainless Steel Scrap

(Each shipping point)

18-8 bundles & solids	160.00-170.00
18-8 turnings	70.00-80.00
430 bundles & solids	70.00-80.00
430 turnings	30.00-40.00

CLEVELAND

(Delivered consumer plants)

No. 1 heavy melting	27.00-27.50
No. 2 heavy melting	25.00-25.50
No. 1 bundles	27.00-27.50
No. 2 bundles	25.00-25.50
No. 1 busheling	27.00-27.50
Machine shop turnings	16.00-16.50
Mixed borings, turnings	16.00-16.50
Short shovel turnings	16.00-16.50
Cast iron borings	17.00-17.50
Low phos. punchings	28.00-28.50
Alloy free cast, clean	31.00-31.50
Electric furnace bundles	27.00-27.50

Cast Iron Grades

No. 1 cupola	34.00-35.00
Charging box cast	34.00-35.00
Stove plate	34.00-35.00
Unstripped motor blocks	28.00-29.00
Brake shoe	34.00-35.00
Clean auto cast	34.00-35.00
No. 1 wheels	37.00-38.00
Rerun cast	39.00-40.00
Drop broken machinery	39.00-40.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
R.R. malleable	38.00-39.00
Rails, 3 ft and under	41.00-42.00
Rails, 18 in. and under	41.00-43.00
Rails, random lengths	38.00-39.00
Cast steel	32.00-33.00
Railroad specialties	42.00-43.00
Uncut tires	34.00-35.00
Angles, splice bars	38.00-39.00
Rails, rerolling	38.00-39.00

Stainless Steel Scrap

(Each shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	30.00-50.00

YOUNGSTOWN

(Delivered consumer plants)

No. 1 heavy melting	25.00-26.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	25.00-26.00
No. 2 bundles	18.00-19.00
Machine shop turnings	11.00-12.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Low phos.	26.00-27.00
Electric furnace bundles	25.00-26.00

Railroad Scrap

No. 1 R.R. heavy melt.	27.00-28.00

PHILADELPHIA

(Delivered consumer plants)

No. 1 heavy melting	22.00
No. 2 heavy melting	20.00
No. 1 bundles	22.00
No. 2 bundles	18.00
No. 1 busheling	22.00*
Electric furnace bundles	23.00-23.50
Machine shop turnings	11.00
Mixed borings, turnings	12.00
Short shovel turnings	16.00*
Structurals & plate	26.00-27.00
Heavy turnings	20.00
Couplers, springs, wheels	30.00
Rails, random 2 ft & under	41.00

Cast Iron Grades

No. 1 cupola	32.00
Malleable	28.00
Heavy breakable cast	26.50-27.00
Unstripped motor blocks	24.00
Drop broken machinery	41.00

*Nominal

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	14.00
No. 2 heavy melting	12.00
No. 1 bundles	14.00
No. 2 bundles	10.00
Machine shop turnings	4.00*
Mixed borings, shelf	6.00*
Cut plate, structural & boiler	26.00
Short shovel turnings	8.00-9.00*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	24.00-25.00*

Stainless Steel

Free cutting clips, solids	160.00-170.00
18-8 bundles, turnings	70.00-75.00
Lite stock clips, solids	70.00
410 sheets, clips, solids	50.00

*Nominal

BOSTON

(Brokers' buying prices, f.o.b. shipping points)

No. 1 heavy melting	13.25-13.50
No. 2 heavy melting	9.25-11.25
No. 1 bundles	13.25-14.25
No. 2 bundles	9.25-9.75
Machine shop turnings	4.00-5.00
Mixed borings, turnings	4.00-5.00
Short shovel turnings	7.00-8.00
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-37.00

CINCINNATI

(Brokers' buying prices, f.o.b. shipping points)

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	26.00-27.00
No. 2 bundles	23.00-24.00
No. 1 busheling	26.00-27.00
Machine shop turnings	14.00-15.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	14.00-15.00
Cast iron borings	17.00-18.00
Low phos. punchings	28.00-29.00
Electric furnace bundles	27.00-28.00

Cast Iron Grades

(F.o.b. shipping points)

No. 1 cupola	33.00
Heavy breakable cast	31.00
Charging box cast	34.00
Drop broken machinery	42.00

Railroad Scrap

No. 1 R.R. heavy melt.	28.00-29.00
Malleable	32.00-33.00
Rails, 18 in. and under	42.00-43.00
Rails, random lengths	34.00-35.00

CHICAGO

No. 1 heavy melting	27.00-28.00
No. 2 heavy melting	26.00-27.00
No. 1 factory bundles	28.00-29.00
No. 1 dealer bundles	26.00-27.00
No. 2 bundles	22.00-24.00
No. 1 busheling	27.00-28.00
Machine shop turnings	13.00-14.00
Mixed borings, turnings	13.00-14.00
Short shovel turnings	15.00-16.00
Cast iron borings	15.00-16.00
Cut structurals, 3 ft	42.00-43.00
Punchings & plate scrap	31.00-32.00
Electric furnace bundles	29.00-30.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Stove plate	34.00-36.00
Unstripped motor blocks	24.00-25.00
Clean auto cast	40.00-42.00
Drop broken machinery	41.00-42.00

Railroad Scrap

No. 1 R.R. heavy melt.	29.00-31.00
R.R. malleable	39.00-40.00
Rails, 3 ft and under	42.00-43.00
Rails, 18 in. and under	41.00-43.00
Angles, splice bars	35.00-36.00
Rails, rerolling	34.00-35.00

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	40.00-42.00
430 turnings	20.00-22.00

DETROIT

(Brokers' buying prices, f.o.b. shipping points)

No. 1 heavy melting	27.00
No. 2 heavy melting	25.00
No. 1 bundles	28.00
No. 2 bundles	25.00
No. 1 busheling	28.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Short shovel turnings	16.00
Punchings & plate scrap	29.00

Cast Iron Grades

No. 1 cupola	36.00
Charging box cast	35.00
Stove plate	28.00
Heavy breakable cast	28.00
Unstripped motor blocks	28.00
Clean auto cast	40.00
Malleable	28.00

BUFFALO

No. 1 heavy melting	23.00-24.00
No. 2 heavy melting	19.00-20.00
No. 1 bundles	23.00-24.00
No. 2 bundles	17.00-18.00
No. 1 busheling	20.50-21.50
Machine shop turnings	11.00-12.00
Mixed borings, turnings	15.00-17.00
Short shovel turnings	12.00-13.00
Cast iron borings	16.50-17.00
Low phos. plate	27.00-27.50

Cast Iron Grades

(F.o.b. shipping points)

No. 1 cupola	34.00-35.00
No. 1 machinery	37.00-38.00

Railroad Scrap

Rails, random lengths	32.00-34.00
Rails, 18 in. and under	36.00-37.00
Railroad specialties	34.00-35.00

BIRMINGHAM

No. 1 heavy melting	15.00-20.00
No. 2 heavy melting	17.00-18.00
No. 1 bundles	15.00-20.00
No. 2 bundles	15.00-16.00
No. 1 busheling	15.00-20.00
Cast iron borings	13.00-14.00
Short shovel turnings	14.00-15.00
Machine shop turnings	12.00-13.00
Electric furnace bundles	24.00-26.00

Cast Iron Grades

(F.o.b. shipping points)

No. 1 cupola	38.00-40.00
Charging box cast	28.00-29.00
Stove plate	36.00-37.00
Bar crops and plate	28.00-29.00
Structural plate 2 ft	28.00-29.00
Heavy breakable cast	28.00-29.00
Unstripped motor blocks	32.00-33.00
No. 1 wheels	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	23.00-24.00
Rails, 18 in. and under	35.00-40.00
Rails, random lengths	32.00-33.00
Angles, splice bars	35.00-36.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	24.25-25.25
No. 2 heavy melting	21.25
No. 1 bundles	25.00-26.00
No. 2 bundles	16.00-20.00
Machine shop turnings	10.00-11.00
Short shovel turnings	12.00-13.00

Cast Iron Grades

No. 1 cupola	37.00
Charging box cast	37.00
Heavy breakable cast	35.00
Unstripped motor blocks	27.00
Brake shoes	30.00
Clean auto cast	39.00
Stove plate	29.00

Railroad Scrap

No. 1 R.R. heavy melt.	29.00
Rails, 3 ft and under	38.00
Rails, random lengths	34.00
Rails, rerolling	37.00
Uncut tires	30.00
Angles, splice bars	32.00

SEATTLE

(Delivered consumer plants)

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turnings	11.50
Mixed borings, turnings	11.50
Short shovel turnings	11.50
Electric furnace, No. 1	35.00

Cast Iron Grades

(F.o.b. shipping points)

No. 1 cupola	36.00-35.00
Heavy breakable cast	25.00
Unstripped motor blocks	23.00
No. 1 wheels	21.00
Stove plate f.o.b. plant	28.00
Brake shoes	28.00

Railroad Scrap

(Delivered consumer plant)

Rails, random lengths	30.00-31.00

SAN FRANCISCO

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings	5.00
Cast iron borings	8.00
Cut structurals	28.00
Heavy turnings	9.00
Punchings & plate scrap	23.00
Electric furnace bundles	18.00

Cast Iron Grades

No. 1 cupola	28.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	18.00
No. 2 bundles	14.00
Machine shop turnings	5.00

Cast Iron Grades

(F.o.b. shipping points)

No. 1 cupola	40.00

HAMILTON, ONT.

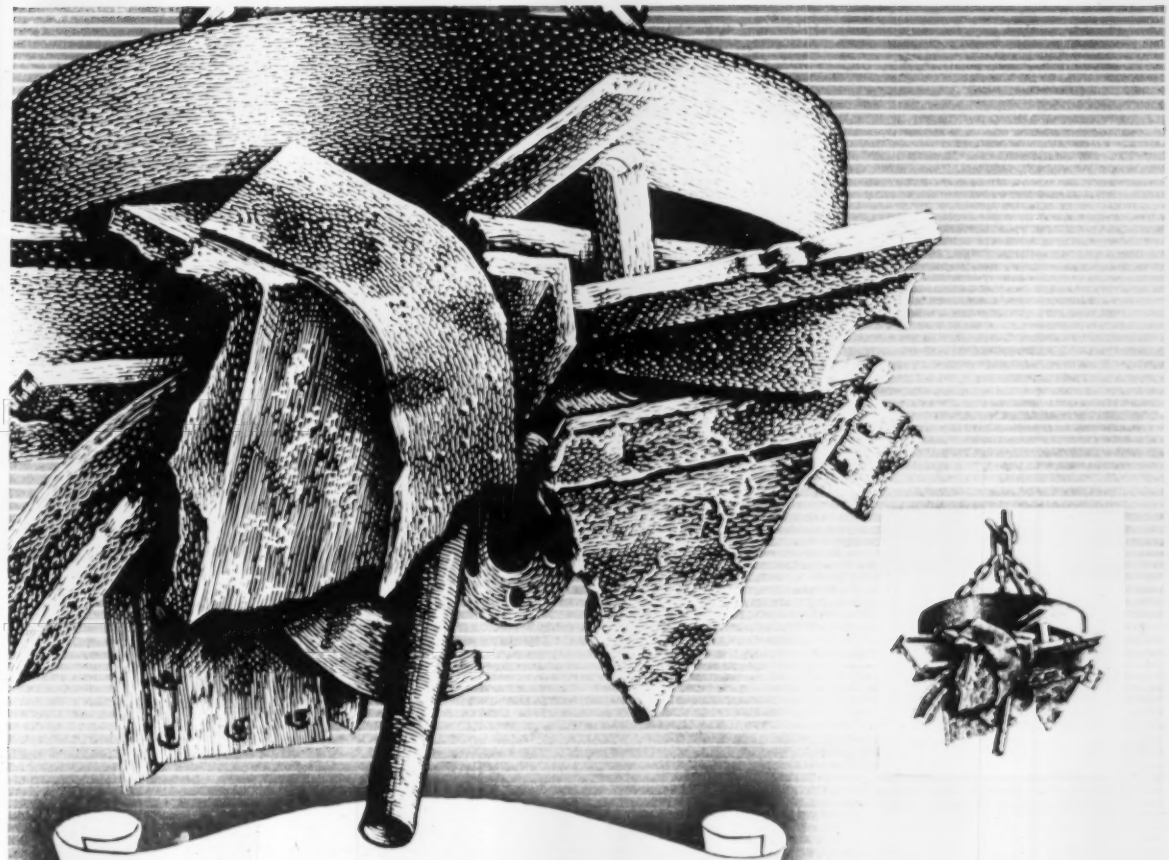
(Delivered prices)

No. 1 heavy melting	$22.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	17.00
Mixed steel scrap	16.00
Mixed borings, turnings	12.00
Rails, rerolling	32.00
Bushelings, new factory	
Prepared	20.00
Unprepared	16.00
Short steel turnings	12.00

Cast Iron Grades

No. 1 machinery cast	42.00-45.00

(F.o.b. shipping point)



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Advertising Index

Accurate Perforating Co.	236
Air Conversion Research Corporation	59
Allegheny Ludlum Steel Corporation	54
Alliance Machine Co., The	194
Allis-Chalmers	122, 123
American Brass Co., The	76
American Broach & Machine Co., A Division of Sundstrand Machine Tool Co.	66
American Chemical Paint Co.	237
American Gas Association	56
American Roller Die Corporation	162
American Steel & Wire Division, United States Steel Corporation	50, 51
American Wheelabrator & Equipment Corporation	34
Anaconda Wire & Cable Co.	167
Apex Tool & Cutter Co., Inc.	236
Armco Steel Corporation	88
Arrow-Hart & Hegeman Electric Co., The, Industrial Control Division	61, 62
Atkins Saw Division, Borg-Warner Corporation	153
Babcock & Wilcox Co., The, Refractories Division	127
Bailey, William M., Co.	41
Barber-Colman Co.	47
Bay State Abrasive Products Co.	53
Becker Bros. Carbon Co.	241
Bendix Aviation Corporation	241
Bethlehem Steel Co.	1
Birdsboro Steel Foundry & Machine Co.	24
Bixby, R. W., Inc.	241
Blaw-Knox Co., Lewis Machinery Division	21
Bliss, E. W., Co.	43
Borg-Warner Corporation, Atkins Saw Division	153
Brown & Sharpe Mfg. Co.	17, 18, 58
Browning, Victor R., & Co., Inc.	236
Buffalo Forge Co.	32
Buffalo Steel Division, H. K. Porter Co., Inc.	192
Bullard Co., The	106
Bunting Brass & Bronze Co., The	78
Burgess-Norton Mfg. Co.	199
Cameron Iron Works, Inc., Forge & Ordnance Division	221
Carborundum Co., The	171
Carpenter Steel Co., The	223
Cattie, Joseph P. & Brothers, Inc.	228
Chemsteel Construction Co., Inc.	237
Cincinnati Bickford Tool Co., The	77
Cincinnati Shaper Co., The	8, 9
Cleveland Hotel	240
Cleveland Steel Tool Co., The	232
Cleveland Worm & Gear Co., The	Inside Back Cover
Colonial Broach Co.	181
Colorado Fuel & Iron Corporation, The, Wickwire Spencer Steel Division	119
Columbia-Geneva Steel Division, United States Steel Corporation	49, 50, 51
Conoco Engineering Works Division of H. D. Conkey & Co.	159
Cone-Drive Gears Division, Michigan Tool Co.	228
Continental Foundry & Machine Co.	151
Copperweld Steel Co., The	109
Copperweld Steel Co., Ohio Seamless Tube Division	134
Cowles Tool Co.	228
Crucible Steel Company of America	60, 217
Cutler-Hammer, Inc.	Back Cover
Dempster Brothers	180
Denison Engineering Co., The	52
Detrex Corporation	185
Detroit Stamping Co.	225
Diamond Manufacturing Co.	230
Dulien Steel Products, Inc.	241
Du Pont, E. I., de Nemours & Co., Inc.	15
Duralay Co., The	173
Eastern Machine Screw Corporation, The	236, 241
Easton Car & Construction Co.	222
Ederer Engineering Co.	152
Elastic Stop Nut Corporation of America	33
Electric Controller & Mfg. Co., The	Inside Front Cover
Electric Furnace Co., The	231
Electric Storage Battery Co., The, Industrial Division	193
Electro Metallurgical Co., A Division of Union Carbide & Carbon Corporation	20
Fafnir Bearing Co., The	31
Fawick Airflex Division, Federal Fawick Corporation	117
Federal Bearings Co., Inc., The	91
Federal Fawick Corporation, Fawick Airflex Division	117
Fellows Gear Shaper Co., The	157
Fallansbee Steel Corporation	204
Garlock Packing Co., The	42

(Continued on Page 242)

(Concluded from page 237)

scribed as adequate. Cast iron grades are moving steadily with prices firm.

Seattle—The scrap market is weak with supplies ample. Larger buyers are apathetic to dealers' offerings. From a dealers' standpoint the situation is worsening. Further survey of the Japanese area is being made in the hope of developing an export movement from this side. Prices are unchanged.

Iron Ore . . .

Iron Ore Prices, Page 229

Chicago—Inland Steel's fleet started its 1951 lake shipping season Apr. 13 when the *L. E. Block* left Indiana Harbor for Port Inland, Mich. It will return with a cargo of limestone. Three of Inland's other vessels, including the fleet flagship, *Wilfred Sykes*, will leave on their first runs Apr. 19, and another will start out the following day.

Semifinished Steel . . .

Semifinished Prices, Page 212

Youngstown—The district steel operating rate last week dropped to 68 per cent of capacity, with two bessemer plants, 46 open hearths and 13 blast furnaces in operation.

U. S. Steel Corp.'s Ohio Works took off one more open hearth and cut its bessemer operations to six turns. In contrast, Republic Steel Corp.'s Warren Works is operating its iron and steel units full, while Youngstown Sheet & Tube Co., operating its seamless tube units at high level, is operating 10 of 12 open hearths at the Campbell Works and 7 of 12 at Brier Hill, also 5 of its 7 blast furnaces.

U. S. Steel Corp. last week announced further steps in a multi-million dollar expansion and modernization program at its Ohio Works and McDonald mills here. Additional steps include construction of a water circulation system at the Ohio Works for the turbo generator condenser, rebuilding No. 1 blast furnace, and modernization and expansion of the 13-inch strip mill by installing a new coiler, extension of some conveyor tables, a new shear and leveller and piler. U. S. Steel will use some of its idle employees on much of this work.

Seattle—Bethlehem Pacific Coast Steel Corp. is operating 3 of its 5 furnaces at the local plant, the same capacity that has been in operation several months. Business prospects have improved. Northwest Steel Rolling Mills Inc. has maintained 100 per cent operations.

CLASSIFIED

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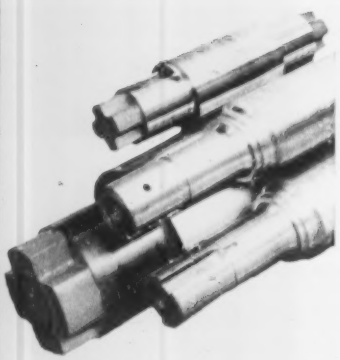

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Advertising Index

(Concluded from Page 240)

Gardner-Denver Co. 68
Gas Machinery Co., The 166
General American Transportation Corporation, Parker-Kalon Division 160, 161
General Electric Co. 37, 182, 183
Gisholt Machine Co. 22
Goodyear Tire & Rubber Co., Inc., The 4
Gorham Tool Co. 12
Greater Lawrence Citizens Committee for Industrial Development 16
Greenfield Tap & Die Corporation 39
Grieder Industries, Inc. 79
Grip Nut Co. 16
Gulf Oil Corporation 154, 155
Gulf Refining Co. 154, 155

Hanson-Van Winkle-Munning Co. 164
Harnischfeger Corporation, Welding Division 46
Haynes Stellite Co., A Division of Union Carbide & Carbon Corporation 69
Heli-Coil Corporation 232
Hendrick Manufacturing Co. 235
Heppenstall Co. 147
Hunt, C. B., & Son, Inc. 234
Hyde Park Foundry & Machine Co. 242

Illinois Gear & Machine Co. 23
Industrial Crane & Hoist Corporation 65
Ingalls Iron Works Co., The 74
International Business Machines 44
Iron & Steel Products, Inc. 241

Jessop Steel Co. 179
Jones & Laughlin Steel Corporation 80

Kennametal, Inc. 177
Kidde, Walter, & Co., Inc. 10

Lake Erie Engineering Corporation 130, 131
Lamson & Sessions Co., The 19
Lapointe Machine Tool Co., The 35
LeBlond, R. K., Machine Tool Co., The 174, 175
Leeds & Northrup Co. 26
Lees-Bradner Co., The 75
Lewis Machinery Division, Blaw-Knox Co. 21
Lima Electric Motor Co., The 189
Lincoln Electric Co., The 229
Linde Air Products Co., A Division of Union Carbide & Carbon Corporation 38
Littell, F. J., Machine Co. 5
Lodding, Inc. 235
Lovejoy Flexible Coupling Co. 232
Lucas Machine Division, The New Britain Machine Co. 27, 28, 29, 30
Lucia Brothers & Co., Inc. 239
Lucia Steel Supply Co. 241

McKay Machine Co., The 101

Macwhyte Co. 3
Malleable Founders' Society 156
Mannesmann-Meer Engineering & Construction Co. 48
Matthews, Jas. H., & Co. 234
Mayline Co. 230
Merit Products, Inc. 230
Michigan Tool Co. 169, 170
Michigan Tool Co., Cone-Drive Gears Division 228
Minneapolis-Honeywell Regulator Co., Industrial Division 224
Minnesota Mining & Mfg. Co. 132
Modern Industrial Engineering Co. 200, 201
Mosch & Merryweather Machinery Co., The 57

National Acme Co., The 45
National Airoil Burner Co., Inc. 129
National Carbon Co., A Division of Union Carbide & Carbon Corporation 120
National Standard Co. 71
National Steel Corporation 67
National Tube Division, United States Steel Corporation 50, 51
New Britain-Gridley Machine Division, The New Britain Machine Co. 27, 28, 29, 30
New Britain Machine Co., The 27, 28, 29, 30
New York & New Jersey Lubricant Co. 220
Niagara Machine & Tool Works 13
Nicholson File Co. 163
Norton Co. 55

Oakite Products, Inc. 188
Ohio Crankshaft Co., The 102
Ohio Locomotive Crane Co., The 232
Ohio Seamless Tube Division of Copperweld Steel Co. 134
O. K. Tool Co., Inc., The 237

Parker Appliance Co., The, Tube & Hose Fittings Division 196, 197
Parker-Kalon Division, General American Transportation Corporation 160, 161
Pawtucket Manufacturing Co. 6
Pennsylvania Flexible Metallic Tubing Co., Inc. 172
Pines Engineering Co., Inc. 63
Pittsburgh Lectromelt Furnace Corporation 125
Pittsburgh Steel Co. 190, 191
Platecoil Division, Tranter Manufacturing, Inc. 82
Porter, H. K., Co., Inc., Buffalo Steel Division 192

Ready-Power Co., The 178
Resin-ite Plastics, Inc. 228
Republic Steel Corporation, Alloy Steel Division 36
Rockford Machine Tool Co. 72, 73
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 40, 83
Ryerson, Joseph T., & Son, Inc. 92

Sargeant & Wilbur, Inc. 220
Seymour Manufacturing Co., The 158
Sheffield Corporation, The 70
Silent Hoist & Crane Co. 231
Simonds Abrasive Co. 128
Simonds Saw & Steel Co. 14
SKF Industries, Inc. 2
Solar Steel Corporation 203
Standard Pressed Steel Co. 64
Standard Tube Co., The 233
Starrett, L. S., Co., The 11
Steel Equipment Co. 81
Sundstrand Machine Tool Co., American Broach & Machine Co. Division 66
Superior Steel Corporation 149

Taylor-Winfield Corporation, The 176
Tennessee Coal & Iron Division, United States Steel Corporation 49, 50, 51
Texas Co., The 84
Timken Roller Bearing Co., The, Steel & Tube Division 110
Tinnerman Products, Inc. 114
Toledo Stamping & Manufacturing Co. 236
Toledo Steel Rail Co. 240
Townsend Co. 165
Tranter Manufacturing, Inc., Platecoil Division 82

Ulbrich Stainless Steels 113
Union Carbide & Carbon Corporation, Electro Metallurgical Co. 20
Union Carbide & Carbon Corporation, Haynes Stellite Co. 69
Union Carbide & Carbon Corporation, Linde Air Products Co. 38
Union Carbide & Carbon Corporation, National Carbon Co. 120
United Engineering & Foundry Co. 133
United States Steel Corp., Subsidiaries 49, 50, 51
United States Steel Export Co. 49, 50, 51
United States Steel Supply Division, United States Steel Corporation 49, 50, 51

Vanadium Corporation of America 211
Versan Allsteel Press Co. 7

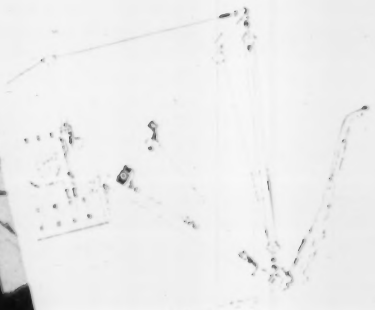
Wallingford Steel Co., The 126
Ward Machinery Co. 230
Waterbury Farrel Foundry & Machine Co. 184
Weirton Steel Co. 67
Western Automatic Machine Screw Co. 25
Westinghouse Electric Corporation, Sturtevant Division 87
Wheeling Steel Corporation 236
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 119
Wisconsin Motor Corporation 222

Yale & Towne Manufacturing Co., The 227
Youngstown Sheet & Tube Co., The 186, 187

Zeh & Hahnemann Co. 236

Table of Contents, Page 5

Classified Advertising, Page 241



Cleveland-driven cutter chewing through mud. Material loosened by the cutter is sucked up by the pump. Photo shows Morris Hydraulic Cutter Dredge with its indestructible 28-year old Cleveland drive.

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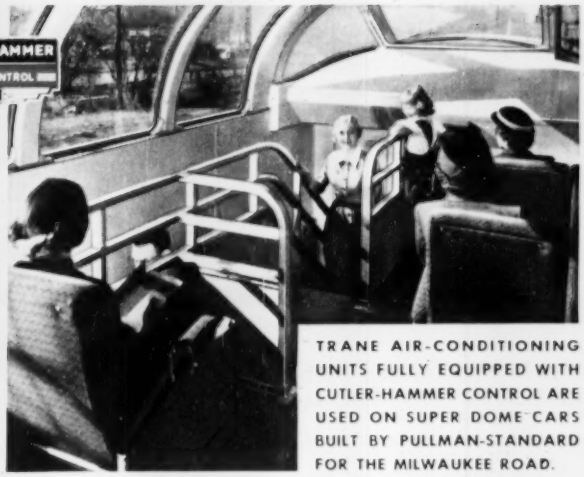

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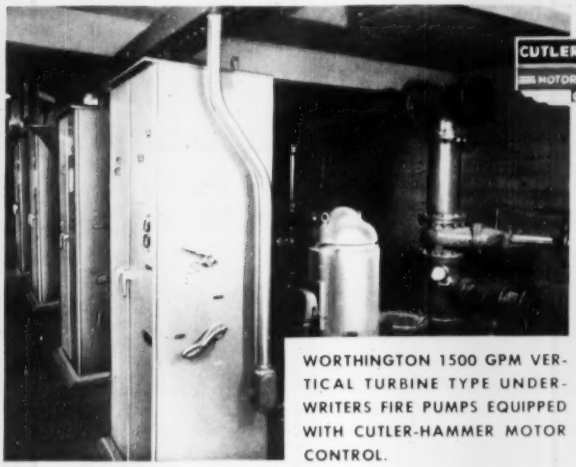
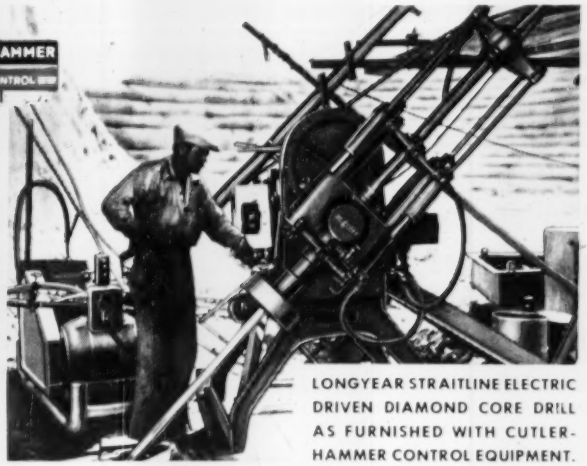


WORTHINGTON 1500 GPM VERTICAL TURBINE TYPE UNDERWRITERS FIRE PUMPS EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL.



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